

The Role of Community in Midwestern General Surgeons’ Practice Location Decisions

By
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Practice Location Decisions**

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Abstract

Introduction. The rural general surgeon shortage in the U.S. is predicted to worsen, leaving nearly one-fifth of the population without adequate access to surgical services. Alleviating this shortage means improving the recruitment and retention of general surgeons in rural communities, but there is disagreement on how to accomplish these goals. The healthcare workforce is often viewed as a pipeline, with decisions about becoming a physician and where to practice taking place in childhood, college, medical school, residency, and continuing after entrance into practice. Previous work has established that physicians who grew up in rural areas are more likely to return to rural areas to practice.

This dissertation brings together the fields of behavioral economics, health services research, and sociology to answer one two-part, quantitative question and two qualitative questions: 1a) What individual characteristics are unique to general surgeons who grew up in an urban area and now practice rurally (urban-rural “movers”) compared to their peers?; 1b) What characteristics are unique to rural communities where urban-rural movers are located versus where they are not?; 2) What is the range of community characteristics that is meaningful to rural and urban general surgeons in practice location decisions?; and 3) What is the role of experiential place integration in rural versus urban general surgeons’ practice location decisions? I argue that understanding how the tangible and intangible aspects of community factor into practice location decisions, and how these interact with surgeons’ identities and roles, is critical to informing efforts to improve rural general surgeon recruitment and retention.

Methods. This is a sequential, mixed-methods study. It first utilized quantitative analysis of secondary data to guide the collection of primary qualitative data, which was analyzed to produce the main results of the study. Quantitative data detailing characteristics of general

surgeons in the 12-state Midwest region were taken from the American Medical Association (AMA) MasterFile and analyzed using univariate, bivariate, and multi-variate testing, including logistic regression in State SE. Qualitative data were collected from general surgeons across 11 of the 12 Midwest states in the form of in-depth, semi-structured interviews. Interviews were transcribed, and analysis was facilitated using NVivo Pro 12. Initial coding utilized principles of grounded theory, and themes that emerged were organized into thematic networks.

Results. Multi-variate linear regression analyses found rural surgeons who were born in urban areas were different from their urban-born colleagues who stayed in urban areas. They were slightly older, male, and completed less-urban residency programs outside the Midwest. If urban-born surgeons were DOs, they also had a higher rate of rural practice than MDs. Rural counties that attracted an urban-born surgeon were more likely to have a hospital, have a slightly larger primary care referral base, have an intensive care unit, and have more grocery stores but also have more arrests due to violent crimes. Qualitative results were largely consistent with quantitative in terms of the range of community characteristics that matters to rural surgeons in their practice location decisions. Rural surgeons emphasized communities are on a rural-urban continuum and rejected a dichotomized definition of rural and urban. They discussed an affinity for less crowded, more wide open space; they viewed positively communities with outward appearances of a healthy local economy; they valued healthcare resources, which shaped their scopes of practice; and they placed less value on amenities than their urban colleagues. All surgeons experienced alignment between their personal (outside of work) and professional (at-work) identities, but they varied in the degree of overlap between their personal and professional roles in their communities. Urban surgeons experienced less overlap, and therefore their experiences integrating into their communities were less intense. Rural surgeons experienced

significant overlap, which resulted in highly intense experiences of place integration over time.

Conclusion. These results can be used to improve many points along the rural health workforce pipeline, but the emphasis here is on the recruitment stage as rural communities seek more surgeons. Communities should focus on having health resources that support surgical practice, but they do not need to be overly concerned about economic development so long as they are on-par with neighboring towns in terms of basic retail. When talking to students, residents, and prospective surgeons, rural communities should help them understand that while being the “town surgeon” comes with recognition, which they may find gratifying, it also comes with a lack of anonymity, which could at times feel stifling. They should also make recruits aware that their professional and personal roles will overlap in a more rural setting, and while this can result in difficult, even emotional, clinical decisions, it can also result in rewarding, long-term patient relationships and intense integration into the tightly-knit social fabric of the place over time. Most rural surgeons found this satisfying and fulfilling, and prospective rural surgeons should be made aware of these lived experiences, not just the quantifiable data on urban versus rural practice.

Acknowledgments

The list of people whose support enabled me to complete this dissertation is long, and for that in and of itself I am grateful. To my committee chair, Dr. Joanna Brooks, thank you for striking such a great balance between advisor and friend. Your wisdom, guidance, and faith in me have been invaluable, and I look forward to continuing to work with you as we both progress in our careers. To the rest of my committee members, Dr. Glen Cox, Dr. Tomas Griebeling, Dr. Tami Gurley-Calvez, Dr. Joshua Mammen, and Dr. Jessica Williams, thank you for all your support and feedback along the way. Your perspectives have enhanced this work and helped ensure it will someday be useful to those who need it most: our rural communities. Thank you so much for your time and expertise.

Without Dr. Mary Zimmerman and Dr. Robert Lee, I would not have started the PhD program when I did; they were instrumental in my earning the Chancellor's Fellowship, and the logistics simply would not have worked without those resources. I am forever indebted to Drs. Zimmerman and Lee, as well as Dr. Mike Werle and Chancellors Bernadette Gray-Little and Doug Girod for making the fellowship possible. Our program director, Dr. Gurley-Calvez, in addition to being a committee member, has been encouraging since day one, when I set foot in her quantitative methods classroom, near-clueless and doubtful of my abilities. She not only taught me valuable subject matter but also helped me to develop professionally and mentored me throughout my time in the program. To all the other faculty members in Health Policy and Management who taught me over the last 13 years, in the master's and doctoral programs, thank you for your time, talent, and patience as I worked to grow as a person and an academic.

The surgeons I interviewed were an inspiration to me. If I had met some of them under different circumstances, I suspect we would have been friends. Some of them intimidated me.

Some were so humble and unassuming that I wondered how they had endured surgical training, which I have always perceived as a grueling process with survival being dependent not only on skill but also a healthy ego. Many times during interviews, I was surprised by what the surgeons told me. Some divulged feelings about their marriages or their children, and some talked about risky operations or having performed only a few of a certain type of operation in their entire careers. These unvarnished statements told me the surgeons were being honest. Why else would they say things that could cast them in a negative light? I do not believe their aim was to shock me, but they did.

In August 2018, I made day-trips to Missouri and Nebraska. In September, I made three week-long trips, the first through Missouri, Illinois, Indiana, Ohio, and back again to Kansas City. My faithful dog, Maggie, even went with me, experiencing doggy daycare in St. Louis, a boarding kennel in Bloomington, Illinois, and then staying with my dear friends Gretchen and Aaron Patch in Indianapolis when I went on to stay with my sorority sister, Mary Ellen Hardies Smalley in Columbus, Ohio. The second trip took me to North Dakota and South Dakota. Maggie stayed at home, but I was fortunate to stay with my second-cousins, Carol and Ken Johnson in Grand Forks. On the final trip, I drove northeast through Missouri, Iowa, Illinois, and the corner of Indiana to northern Michigan and back again. I stopped to take my picture with a covered wagon and a life-sized statue of Abraham Lincoln. I walked along the Indiana Dunes National Lakeshore (now National Park). I walked along Michigan Avenue and past Lake Michigan. I had my picture taken with a statue of a Native American chieftain that must have been three stories tall and the largest buffalo sculpture in the U.S. I drove on roads bordered by seemingly endless cornfields and fields of other grains. The Great Plains of the western Midwest

gave way to the more urban and industrial upper-central Midwest and the more heavily wooded, slightly more hilly eastern Midwest.

The places I saw as I road-tripped were as varied as the surgeons themselves. One office was a converted house, with just the one surgeon's office and his wife running the front desk and billing. Others were offices in glass and steel high-rises, with the noise from busy streets reaching us even up so high. Some hospitals still bore the signs of previous decades, with old tile and worn handrails, while others were clearly brand-new, with the latest in million-dollar equipment. No matter where I went, good people were striving to provide the best care they could to people they cared about.

My own perspective is colored by my upbringing. I, myself, am the daughter of a rural general surgeon. From ages 12 to 17, I lived in a central Kansas town of 13,000 people, and my high school graduating class was the largest in the county at 210. Previously, my family and I had lived in Dallas, so it was our frame of reference for what "large" was. My parents had lived there for more than 40 years before moving us to Kansas. We experienced our own versions of place integration, and now, we all identify as Kansans. My father adopted the mantle of a rural surgeon as if it had always been his, serving as an advocate for his fellow rural surgeons at the state and national levels.

As I complete this dissertation and stare at my future, I contemplate my place in the world and how I can do the most good. My dissertation chair recently told me she re-read the conclusion of *Beyond Caring*, by Daniel F. Chambliss, and I, too, got out my copy. The final two sentences were especially poignant:

People don't live only in bright visible moments of decision; they live, and die, and work in the ordinary everyday world. For sociologists and ethicists to understand and help people more, we should remember to live and work there, too. (Chambliss, 1996)

The surgeons I interviewed talked about their decision points, but they revealed so much more about themselves and their everyday worlds. I am resolved to live and work in the everyday world so that I might give voice to those too busy with everyday life to tell their own stories. I pray I do them justice.

My friends have been wonderfully supportive, and I must especially thank Dawn Johnson, Gretchen Patch, Kelsi Remmert, and Rebecca Zylberman for being my career-lady cheering squad. Whenever I would falter or express self-doubt, they would patiently listen, then remind me of past accomplishments and restore my confidence that this, too, I could achieve.

I leave my family for last since, literally, without my parents I would not be here. My mother, Mary Hughes, has pushed me, supported me, and been a delight even when telling me to get back to work. I am sure many times she tired of my father and me droning on and on about healthy policy, but she has always shown interest, been inquisitive, provided insights, and told me I can do anything if I work hard enough. Finally, I thank my father, Dr. Tyler Hughes. I am grateful to follow as the second Dr. Hughes, as the first has been such an incredible example of principled, servant leadership in the field of general surgery and the broader world of rural health. Truth be told, he was my entrée into the world of general surgery, and I am certain the Hughes name increased my initial access to the general surgeons who so graciously gave of their time and energy as my interviewees.

Dad, I may not have become a medical doctor, but I will work to carry on your legacy in rural general surgery however I can.

I am so grateful for having experienced this entire process, both the difficulties and the rewards. I am a different person today than when I set out, and I have been changed for good.

Dedication

To previous generations: Hughes, Henry, Murphy, and Harrang.

Across the Midwest, from rural to suburban to urban, you served your country and your communities, striving to leave the world a better place.

Thank you for your example and for passing down to me intellectual curiosity, independence, and the value of community.

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Part I: Setting the Stage

Chapter 1: Introduction

Background

Rural areas and their residents are by definition isolated, which means time and distance create unforgiving barriers to care. As a result, rural residents can experience delays in care or may even forego care in both emergent and non-emergent situations (Pathman & Ricketts, 2009). In addition, these areas and their populations have a shortage of physicians. Time and distance act in concert with the physician shortage to perpetuate and exacerbate rural health disparities. Rural Americans comprise nearly one-quarter of the US population, yet they have about 4.67 general surgeons per 100,000 people, whereas urban areas have 39 to 65 percent more (Christian Lynge, Larson, Thompson, Rosenblatt, & Hart, 2008; Thompson, Lynge, Larson, Tachawachira, & Hart, 2005). To address disparities by increasing the rural surgical workforce, we must first acknowledge what we do and do not know about why surgeons choose rural practice. The literature suggests economic and non-economic factors can both ‘push’ or ‘pull’ surgeons toward rural practice.

While general surgeons are integral to the provision of primary care in rural areas, they are almost never eligible for the most common economic incentives to practice in these underserved areas: state and federal loan repayment programs (Avery & Wallace, 2015; Pathman & Ricketts, 2009). Even when local incentives are offered such as property tax breaks, malpractice coverage, or signing bonuses, evidence from behavioral economics demonstrates people do not always make decisions in their economic best interests (Samson, 2017; Thaler, 2016). Instead, attitudes, preferences, and beliefs affect how surgeons interpret and apply their own individual characteristics and those of the potential practice community while choosing a

practice location. It is imperative to examine what factors other than direct economic incentives affect practice location decisions.

Evidence from existing physician workforce research indicates rural upbringing, training location, family members' proximity, and community size are strongly related to a new physician choosing to practice in a rural area (R. G. Brooks, Walsh, Mardon, Lewis, & Clawson, 2002; Daniels, VanLeit, Skipper, Sanders, & Rhyne, 2007; Hancock, Steinbach, S.Nesbitt, Adler, & Auerswald, 2009). Regardless of the strong correlation between rural upbringing and rural practice location, recruiting physicians to rural areas only from among those who grew up there will not alleviate the current shortage. There are not enough rural high school graduates who progress to college, then medical school, and then specialize in general surgery to bridge this gap. Of all medical school graduates, only 10 percent choose general surgery in this era of increasing sub-specialization (Avery & Wallace, 2015; Cogbill, Cofer, & Jarman, 2012; Fraher, Knapton, Sheldon, Meyer, & Ricketts, 2013; Valentine et al., 2011). Urban areas have larger populations and therefore a larger population of potential rural physicians. It is important to identify which of these physicians are potential rural physicians so that rural recruitment efforts can be tailored to the most receptive individuals.

Problem

While the rural health workforce has been the subject of much excellent research for decades, previous work has tended to focus on the demand for primary care services and the supply in primary care specialties such as family and internal medicine and pediatrics. We need to know more about how individual general surgeon characteristics interact with community characteristics in order to determine 1) who is predisposed to choosing a rural practice location, regardless of where they were raised, so we can target for recruitment, and 2) what community

characteristics are appealing to different kinds of individuals and why, so this information can be used in both recruitment and retention. We have reason to believe surgeons are different from primary care physicians in how they make decisions, and therefore it is important to examine the rural surgery workforce separately from other rural specialties.

My dissertation examines this issue by exploring the individual characteristics of surgeons, the characteristics of the communities where they practice, and how the surgeons and their communities interact. Describing the similarities and differences in these areas will help explain why some surgeons who grew up in rural areas now practice in rural areas, and why some move to urban areas, as well as why some surgeons who grew up in urban settings stay in like areas, and why some move to rural areas. The surgeons brought up in urban areas who have chosen rural practice locations can provide a particularly valuable perspective. They can help describe the type of future surgeon who could be made into a “mover,” so to speak: a person who does not choose an urban practice location like where they grew up and instead chooses a rural community in great need of their services.

Little is known about how the factors affecting practice location choice differ between urban and rural surgeons. While upbringing, training locations, family proximity, and community size have been found to be relevant for rural practice location, the literature does not currently address how unique these factors are to rural surgeons. It is possible that these factors are just as important to urban surgeons but perhaps in different ways. The majority of physician workforce research is conducted using secondary data from professional organizations or educational institutions and survey data, so my dissertation makes an important contribution by including data on amenities, which follows work in behavioral economics and professional sorting, to add dimension. The literature also lacks detail on why some individual and

community factors push or pull some surgeons to their practice locations and how this pushing and pulling is or was experienced by rural versus urban surgeons. The last domain, the interaction of individual and community characteristics, may also affect practice location decisions, likely through general surgeons' senses of identity and career satisfaction. Throughout this dissertation, this interaction is termed "experiential place integration."

My dissertation aims to address gaps in knowledge about the role of individual and community characteristics and their interaction by studying Midwestern general surgeons. Instead of focusing on rural upbringing as a reliable predictor of rural practice location, in the quantitative analyses I single out current rural surgeons who were raised in urban areas and seek to explain why they changed from urban to rural. I investigate not only what individual-level characteristics may be associated with changing from urban to rural but also investigate the differences between communities that have these "urban-rural movers" compared to communities that do not. This careful examination of "urban-rural movers" and their communities is innovative in the surgical workforce literature.

Quantitative methods have limitations, notably the inability to probe responses and gain in-depth understanding of the meanings behind given answers. Therefore, this dissertation uses qualitative methods to answer the second and third research questions. Qualitative interviewing can capture the level of detail necessary to create the next generation of workforce research. Such detail gives recruiters, researchers, surgical educators, and policymakers a better chance at being successful matchmakers, finding ways to pair the right surgeons with the right communities. This will result not only in personal and professional satisfaction for the surgeon but also more access to surgical services for rural Americans and, eventually, potentially a decrease in rural health disparities. This approach, asking not only which surgeons are the right

fit for rural areas, but going further and asking which communities are the right fit for which surgeons, is a new innovation in this field.

The literature on experiential place integration is often found in sociology or sociology-adjacent fields. It also more frequently uses qualitative methods. This proposed dissertation is an effort to bridge parallel discussions that are occurring in health services research, behavioral economics, and sociology, not only bringing differing methods together, but also bringing differing fields together. This work recognizes the value of starting with a quantitatively-informed baseline of knowledge then leveraging the strengths of qualitative methodologies. Health Resources and Services Administration (HRSA) Area Health Resource File (AHRF) data and AMA MasterFile data are both frequently used in this research area, but they are not frequently paired and even less frequently joined with amenities data to examine the role of community characteristics in workforce issues. The use of qualitative interviews allows for a richness of data that cannot be achieved using secondary data or surveys. Experiential place integration is a factor particularly difficult – and some might say impossible – to study using secondary data or surveys, making the use of this method a crucial component. This uniting of fields, methods, and perspectives results in strong evidence that can fuel the development of better rural general surgeon recruitment and retention. It is not only significant and innovative, but it is applicable to real people and a current problem with far-reaching implications for population health.

The conclusions in this work can help develop new recruitment and retention models for rural general surgeons and thereby improve access to surgical services and decrease rural health disparities.

Research Questions

- 1a) What individual characteristics are unique to general surgeons who grew up in an urban area and now practice rurally in the Midwest (urban-rural movers)?
- 1b) What characteristics are unique to Midwestern rural communities where urban-rural movers are located versus where they are not?
- 2) What is the range of community characteristics that is meaningful to rural and urban Midwestern general surgeons in practice location decisions?
- 3) What is the role of community integration in rural versus urban Midwestern general surgeons' practice location decisions and professional identities?

Diagram of Analysis

Figure 1 is a diagram of the analysis in this dissertation. The outcome of interest, on the right side of the figure, is a general surgeon choosing a rural practice location. In the top-left box are tangible surgeon characteristics such as age, sex, and training; in the center-left box are intangible surgeon characteristics such as values, attitudes, and preferences. Those intangible characteristics serve as filters for tangible community characteristics believed to be related to practice location choice.

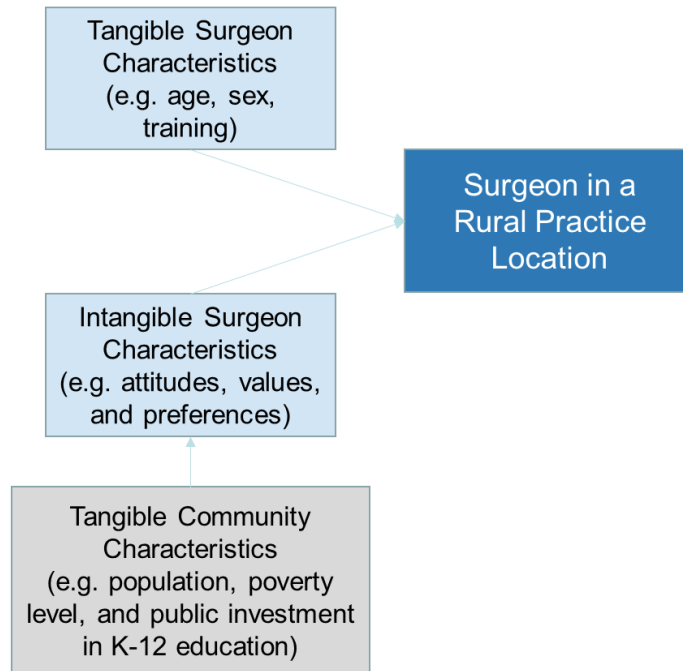
Literature focusing on career choice emphasizes the role of personal characteristics as well as personal preferences (Lent, Brown, & Hackett, 1994; Lent, Ezeofor, Morrison, Penn, & Ireland, 2016; Lent, Ireland, Penn, Morris, & Sappington, 2017). This is why the conceptual model places importance on the intangible characteristics of general surgeons, such as their attitudes, values, and personal expectations and also takes into account more tangible characteristics such as hometown location, location of educational institutions attended, and sex. Observable community characteristics such as population, median home incomes, and amenities

are important because of the way they are considered according to the surgeons' values, preferences, and attitudes (Ariely & Norton, 2007; R. G. Brooks et al., 2002; Hancock et al., 2009; Samson, 2017).

This filtering of tangible community characteristics through attitudes, preferences, and values is also relevant to the shaping of personal and professional identities and roles. There is evidence in the literature that self-actualization and perception of one's role in a community is important in rural practice location choice, and data from my preliminary work reflected the importance of how surgeons see themselves (Hancock et al., 2009; Kilpatrick, Cheers, Gilles, & Taylor, 2008). The indication in my preliminary data that a surgeon's sense of professional identity is not static but instead evolves over the course of his or her career needs further exploration. Since this dissertation relies on data from surgeons who are already practicing, rather than medical students or surgical residents, I am able to include some discussion of how identities and roles may have changed over time.

The tangible characteristics of both surgeons and communities are primarily explored through the quantitative methods of this dissertation, whereas the intangible characteristics are primarily investigated using qualitative methods. The qualitative methods also elucidate some of the effects of key influencers such as spouses, families, and mentors in physician specialty and practice location choices (Avery & Wallace, 2015; Barshes et al., 2004; Cogbill et al., 2012; Kent, Foley, & Golden, 2015).

Figure 1: Diagram of Analysis



Methods

Nearly one-third of counties in the United States are without even one general surgeon. In addition, recent Census data showed a gain in rural population for the first time since 2010, with the most gains found in towns of at least 10,000 people (Henderson, 2018). Taken together, these data suggested all rural areas were not created equal. Instead, there was something different about rural places that were able to attract people. What remained to be seen was what, precisely, was different, apart from population size. The quantitative portion of this dissertation aimed to 1) separate surgeons into the aforementioned mover and stayer categories and explore how urban-rural mover surgeons may be similar to or different from their colleagues, and 2) separate rural communities into those with and without urban-rural movers and describe how those communities are similar or different. The similarities and differences among physicians and also among communities informed the qualitative portion of the dissertation, indicating what concepts need to be added or given greater attention during the interview process.

Use of Mixed Methods. This mixed methods approach was consistent with “quant→QUAL” sequencing (Morgan, 1998). Morgan maintained it is difficult, if not impossible, to conduct a mixed methods study that simultaneously and equally utilizes quantitative and qualitative methods. Instead, he recommended choosing one methodology as the primary and using the secondary methodology to support it. This was accomplished either by utilizing the secondary methodology first, so it provided initial results that helped guide the primary work, or by utilizing it after the primary work is completed, so that it provided additional detail and context. This dissertation was the former. Although the quantitative data collection and analysis were conducted first, the qualitative work was the primary methodology.

Quantitative Design. The quantitative portion of the dissertation was broken into two separate, descriptive analyses: first, a physician-level analysis (Research Question 1a) and second, a community-level analysis (Research Question 1b). These analyses shed light on individual surgeon and community characteristics related to practice location. Surgeon-level data from the AMA MasterFile were the basis for the dataset used in Research Questions 1a and 1b. At minimum, every surgeon included in the analysis was 1) a self-identified general surgeon, and 2) currently practicing in the Midwest, as defined by the U.S. Census Bureau. Each surgeon also had a hometown and a current practice location for which a measure of rurality could be assigned. Since foreign locations are not assigned measures of rurality in the same way that U.S. locations are, general surgeons who were not born in the U.S. were excluded. The ‘hometown’ location was defined as the general surgeon’s city of birth since that was the data available in the MasterFile. General surgeons with missing data for hometown, current practice location, or both were excluded from analysis.

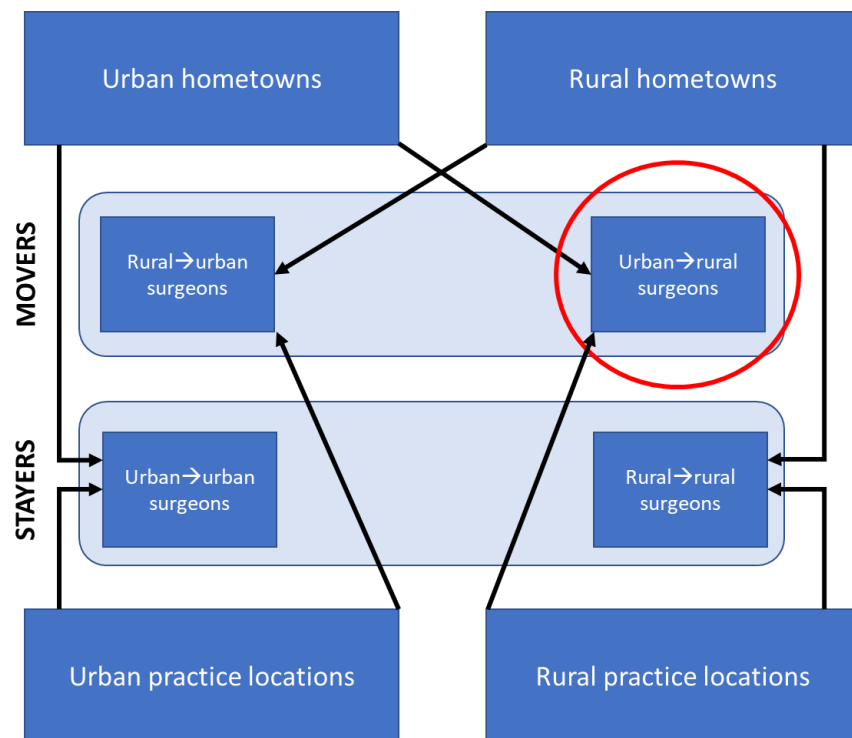
Several additional variables were used to exclude surgeons from analysis. First, surgeons who were “presumed dead” were not included. Second, surgeons who were listed as “last-year residents” or “all other residents” were excluded, as they were still in training and could not qualify as currently practicing general surgeons for purposes of this dissertation. Last, locum tenens surgeons were excluded since, by definition, they did not have a permanent current practice location. Table 1, below, lists the exclusion criteria for general surgeons in the quantitative analysis.

Table 1: Exclusion Criteria

Surgeons Excluded from Quantitative Analysis
<ul style="list-style-type: none"> • Preferred mailing address outside the Midwest • Self-identified primary specialty is not general surgery • Born outside the U.S. • Presumed dead • Still in training • Locum tenens

General surgeons who grew up in an urban area and now practice rurally are termed urban-rural “movers” in this dissertation. This group is highlighted in Figure 2 with a red circle. The underlying assumption was that they were somehow different from the three other groups of general surgeons: those who grew up in a rural area and now practice in an urban area (rural-urban “movers”), those who grew up rural and practice rurally (rural-rural “stayers”), and those who grew up urban and remained urban (urban-urban “stayers”). While the literature shows rural upbringing is related to later rural practice, little is known about surgeons with urban upbringing who later choose rural practice. They were the focus of this portion of the dissertation because, as previously mentioned, they represent a much larger population from which rural areas could potentially attract surgeons.

Figure 2: Illustration of Types of Movers and Stayers



Because workforce research often focuses on individual physician characteristics, these variables were first used in Research Question 1a to describe which individual characteristics are related to that surgeon practicing in an area similar to or different from his or her hometown. Research Question 1a aimed to study the relationship between hometown and current practice location. The unit of analysis was the surgeon. Multi-variate regression was used to test whether having been born in a rural area remained statistically significant even after controlling for other surgeon characteristics. These analyses were run using a dataset including all general surgeons in the Midwest. In the second model, the dataset was narrowed to general surgeons in the Midwest born in urban areas. This model tested what surgeon characteristics were associated with an urban-born surgeon now practicing in a rural area. Birth city and current city variables were both available in the AMA MasterFile, allowing for assignment of rurality using an established measure known as Rural-Urban Continuum Codes (RUCCs). For these purposes, urban was

defined as RUCC codes 1-3, and rural was defined as RUCC codes 4-9, which was consistent with the RUCC division between metropolitan and non-metropolitan counties ("Rural-urban continuum code, 2013," 2013).

Qualitative Design. The qualitative portion of this dissertation answered two research questions: Research Question 2) What is the range of community characteristics that is meaningful to rural and urban Midwestern general surgeons in practice location decisions? and Research Question 3) What is the role of experiential place integration in rural versus urban Midwestern general surgeons' practice location decisions and professional identities?" These questions followed directly from Research Question 1, which through quantitative analyses laid out the range of tangible surgeon and community characteristics important in practice location decisions. Questions 2 and 3 allowed for the exploration of social context and information on more intangible, less measurable factors like personal values, attitudes, and preferences as well as perceptions of communities.

Regarding Research Question 2, at the outset of data collection, it was anticipated that while rural and urban general surgeons could identify some of the same community characteristics as critical to their practice location decisions, they could characterize them differently. For example, rural and urban surgeons might both emphasize family and recreational factors, but they could take on different forms, such as a preference among rural surgeons for small-town upbringing for their children or outdoor recreational opportunities, and among urban surgeons a preference for the inclusion of cultural opportunities in their children's education and entertainment such as professional sports or the symphony. While surveys used in past research may have been able to identify these characteristics as relevant to general surgeon recruitment or retention, qualitative interviews allow for a deeper, richer understanding of why and how they

are relevant. It is this understanding that allowed me to identify why these characteristics meant something different for rural surgeons than their urban counterparts and how these factors influenced the practice location decision-making process for surgeons who ultimately chose rural locations as opposed to urban.

Regarding Research Question 3, qualitative interviews allowed for the development of theory regarding how identity, role, and experiential place integration factored into practice location decisions. The concept of experiential place integration for physicians was based on work by Cutchin and colleagues that described it as the process by which they gained a sense of “security, freedom, and identity” in their practice location (Cutchin, 1997a, 1997b).

Although experiential place integration is a construct used in the literature that was useful in addressing Research Question 3, the purpose of this dissertation was not to test the construct. Based on the literature and pilot interviews, I expected that experiential place integration would be present for both urban and rural surgeons but would be more intense for rural surgeons. I also anticipated this could impact rural surgeons’ practice location decisions to a greater degree than urban surgeons. The concept of experiential place integration has been linked to physician satisfaction, a key element in physician retention (Cutchin, 1997a, 1997b). Addressing the rural surgeon shortage and maldistribution requires addressing both recruitment and retention, including the intangible factors that may affect them, like experiential place integration and satisfaction.

I have theorized that the various types of movers and stayers are different; therefore, this concept needed to be explored in more depth in the qualitative phase. The interview sample was divided in such a way as to allow for comparisons between groups along this central concept of

interest: movers versus stayers. Initially, the goal was to identify 10 urban-rural movers, 10 urban-urban stayers, 10 rural-urban movers, and 10 rural-rural stayers (see Table 2).

Table 2: Initial Goals for Interview Cells

	Practicing in an urban area	Practicing in a rural area
Grew up in an urban area	10	10
Grew up in a rural area	10	10

Other sampling considerations revolved around the current demographics of the profession. Surgery is still dominated by men and is largely White/Non-Hispanic or Caucasian in race/ethnicity. It was reasonable to believe that gender and ethnicity could emerge as concepts important in a surgeon's life and the shaping of his or her attitudes, beliefs, and values. However, the use of convenience and snowball sampling limited my ability to purposively sample these sub-groups. Nonetheless, I was able to generate a sample that represents a comprehensive range of perspectives, rather than a representative sample (Devers, 1999).

I determined a priori that in-person interviews would be conducted unless travel was not logistically possible. In such circumstances, phone interviews were used. A semi-structured interview guide was developed first for the pilot interviews, then slightly modified for the remainder of the interviews. All interviews were digitally recorded.

Data analysis was conducted according to grounded theory, which, in the words of Kathy Charmaz, "requires us to stop and ask analytic questions of the data we have gathered" (Charmaz, 2014). Initial coding was conducted during and immediately following data collection. A codebook was developed throughout data collection, in accordance with the iterative nature of grounded theory (Charmaz, 2014; Starks & Trinidad, 2007). I consulted with

the dissertation committee on questions that arose related to sampling, data collection, and analysis.

The field notes and memos kept throughout this process were critical to ensuring methodological rigor. The literature identifies post-positivist criteria that run parallel to the positivist constructs of internal validity, external validity, reliability, and objectivity; they are: credibility, transferability, dependability, and confirmability (Devers, 1999). Field notes and memos offer evidence of the research design, the details of data collection, and important nuances of the study's context. Through this evidence, I have been able to show why my results were credible, how they could transfer – or be 'generalizable' – to other general surgeons or practice settings, state why my results are dependable, and offer assurances that my results did not come from my own biases but were instead directly from the data. The processes of thick description, persistent observation, and peer review and debriefing also added to the qualitative rigor (Morse, 2015).

Sampling. Convenience and snowball sampling were used to compose the qualitative sample. The sampling frame was general surgeons in the 12-state Midwest region who were currently in practice, grew up in the United States, and self-identified as general surgeons. In the proposal stage, I indicated that a list of 50 potential interviewees would be developed prior to data collection and that phone calls would be used to screen these potential participants before conducting in-person interviewees. Logistically, it proved impractical to develop the full list and conduct screenings. As participants consented to be interviewed, it was clear through brief email exchanges that they met the inclusion criteria. I also learned quickly that it was difficult to schedule time with practicing surgeons, and asking for both a screening call and an in-person

interview could have dampened their willingness to participate. I was not willing to take that risk and instead proceeded directly to the interviews.

There were 10 primary sources used to begin the snowball, all of whom were personal or professional contacts in the field of surgery. Three were located in Kansas, two were in Michigan, one in Illinois, one in Iowa, one in Ohio, one in Oregon, and one in Washington. Those located in Oregon and Washington were not eligible for inclusion but were able to provide referrals. Four additional primary sources in Missouri, Washington, and Wisconsin were also contacted but did not result in any referrals. In total, 55 names were compiled from these 10 sources. In case of inadequate sampling, nine names were collected from the list of American College of Surgeons State Governors in the Midwest as possible sources and interviewees. Contact was made primarily through email with follow-up phone calls when necessary. Data collection occurred simultaneously with sampling, therefore of the 55 names collected, 45 had been contacted when sampling ceased because saturation had been reached.

The 10 surgeons who were left on the list and not contacted were located across Kansas, Minnesota, North Dakota, and Wisconsin. Those who were included in the final sample covered 11 of the 12 Midwest states, with the twelfth being Wisconsin. If a surgeon from Wisconsin had participated, it is possible the sample could have included all 12 Midwest states. However, Wisconsin is located in the east north central region, the same U.S. Census sub-region as Illinois, Indiana, Michigan, and Ohio, and the final sample included surgeons from all of those four states. There was no reason to believe that an interviewee from Wisconsin would have changed the results. It should be noted that of the four sources who were not able to provide referrals, two were located in Wisconsin; a significant effort was made to include perspectives from that state.

Of the 45 contacted, 40 agreed to be interviewed. Of the five who did not agree to be interviewed, four did not respond to requests for an interview, and one initially responded, expressed doubt regarding his availability for an interview, then did not respond to follow-up contact. Of the 40 who agreed, two were not able to be scheduled, one due to my schedule and one due to theirs. One surgeon had to be excluded because I discovered after the interview began that he grew up abroad. The interview was completed, but the data were not used. Everyone who agreed to be interviewed and could be scheduled was interviewed; those meeting the selection criteria were included, which resulted in 37 interviewees in the final sample. Details on how convenience and snowball sampling proceeded can be found in Appendix C.

Since the qualitative research questions inquired about the role community in practice location decisions and the experience of integrating into a community, sampling ceased when saturation was reached on those topics (Corbin & Strauss, 2015; Hennick, Kaiser, & Marconi, 2017). At the close of pilot interviews 1-5 and dissertation interviews 1-32, for a total of 37, new data were no longer being uncovered regarding the role of place and the experience of place integration.

Table 3 indicates the total number of interviewees who fit into each cell according to their county's RUCC classification. Although initially I proposed obtaining at least 10 surgeons in each cell, that was before I understood that overall saturation would be reached prior to filling each cell with 10 surgeons. The research questions at hand concerned the role of place in practice location decision-making, and those data were obtained sufficiently with the counts below.

Table 3: Interviewee Cells by RUCC

	Grew Up Rural (RUCC)	Grew Up Urban (RUCC)
Currently Rural (RUCC)	10	8
Currently Urban (RUCC)	4	15

The sample included 30 men (81.1%) and 7 women (18.9%) ranging in age from 31 to 70, with an average age of 51. Most were married (89.2%), and most had children (83.8%). There was a great deal of variation in: education pathways, such as pursuing community college first or pursuing a master's or PhD degree before, during, or after medical training; training experiences, such as finishing residency somewhere other than where one started; levels of training, including some who completed fellowships; timing of and certainty about their decisions to become a physician and surgeon; current roles related to surgical education, such as having an academic appointment or serving as a preceptor; number and type of communities in which they have lived, including those who have had only one practice location and others who have had more than three; and practice models, including employed surgeons as well as those in private practice.

During each interview, I wrote field notes by hand, and throughout the data collection process, I wrote memos regarding the interview locations, the experiences of interviewing, and comments and questions to which I wanted to return during data analysis.

Analysis. First, all transcripts were imported into NVivo 12 Pro. All memos and field notes were entered into NVivo as linked memos, tied to the individual interview to which they pertained. Any memo that crossed multiple interviews was entered as its own NVivo memo. Engaging in processes like memoing and notetaking allowed the research to be introspective and engage in the iterative nature of grounded theory (Charmaz, 2014; Corbin & Strauss, 2015; Starks & Trinidad, 2007).

A subset of four transcripts was selected for an initial round of open coding by me and my dissertation chair. Each transcript represented a different cell in the interviewee matrix: urban-urban stayers, urban-rural movers, rural-rural stayers, and rural-urban movers.

These four initial transcripts were coded thematically using grounded theory principles; that is, we remained grounded in the data, formulating codes that corresponded to the data. I assembled a draft codebook, then my dissertation chair reviewed the same transcripts, and we conferred regarding the draft codebook. We agreed to narrow the number of codes so we could more clearly link them with the research questions. I again coded the four initial interviews, we again conferred, and we agreed on the next iteration of the codebook. I further tested the draft codebook by using it to code the five pilot interviews. During this process, I refined the descriptions of each code, then met again with my dissertation chair.

Several codes were created solely for the purpose of classifying the interviews. These codes classified the interviewees according to where they grew up and where they currently practiced. While reading the transcripts, I concluded that the RUCC code assigned to the county where interviewees grew up or the county where they currently live, or both, did not necessarily align with the interviewees' perceptions of those places' urbanity or rurality. One example occurred in a county with an RUCC of 2. Looking at the map, it was apparent that this urban classification was due to a metropolitan area in the far northwest portion of the county. The interviewees from this county described their everyday existence as being entirely separate from the urban area. They insisted theirs were rural practices. This kind of disconnect between RUCC classification and surgeon perception occurred for a couple surgeons who described their hometowns as "small towns," but when I researched their RUCCs, they were in fact within urban counties. For this reason, interviewees were classified using eight codes, four for RUCCs and four for surgeons' own perceptions: grew up urban-RUCC, grew up urban-self, grew up rural-RUCC, grew up rural-self, currently urban-RUCC, currently urban-self, currently rural-RUCC, and currently rural-self. The 'self' portion of code names indicates how interviewees perceived

their locations. In each transcript, I made annotations indicating the data that governed my choice of code assignment, particularly for the ‘self’ classification codes. Table 4 indicates the distribution of interviewees across the mover and stayer cells when individual perceptions of urbanity and rurality, rather than RUCC code, was used.

Table 4: Interviewee Cells by Self-Perception

	Grew Up Rural (Self-Ident)	Grew UP Urban (Self-Ident)
Currently Rural (Self-Ident)	16	6
Currently Urban (Self-Ident)	9	6

There seemed to be no disagreement about what ‘rural’ was. All those who were practicing in rural areas according to RUCCs (n=18) also identified themselves as practicing in rural areas. Of those who were practicing in urban areas by RUCC (n=19), however, 4 self-identified as practicing in a rural area, and the remaining 15 identified as urban. Similarly, those who grew up in rural counties according to RUCCs (n=14) all self-identified as having grown up in rural areas. Of those who grew up in urban counties according to RUCCs (n=23), nearly 50 percent, or 11 surgeons, self-identified as having grown up in rural areas instead. The remaining 12 self-identified as having grown up in urban areas.

Some of this discrepancy could be explained by the size of counties and the fact that a more rural-type town, with small population and relative isolation from the urban center, could exist in the same county with that urban center. Some of the discrepancy could be explained by the time that elapsed for some of these surgeons. Even those who were newly in practice and in their 30s could have graduated from high school approximately 20 years ago, in which time a rural place could convert to a suburban place, or a suburban place with a “small-town feel” could convert to a more urban place. Time and political boundaries confounded data analysis on recruitment and retention, as it was difficult to understand and categorize the environments in which surgeons grew up.

I also created codes to classify interviewees as either male or female, according to how they self-identified. I chose not to classify interviewees by age. Generational differences in how surgeons chose their practice locations were not the primary focus of this dissertation. In the qualitative sample of 37, dividing surgeons into types of movers and stayers resulted in a small number of surgeons per cell. Further dividing these cells by generation would have rendered subsets too small for meaningful analysis. It should be noted, however, that the sample included surgeons who completed their surgical training prior to implementation of the 2003 Accrediting Council on Graduate Medical Education (ACGME) duty hours restrictions as well as surgeons who trained after these changes were implemented ("History of Medical Education," 2007). These differences in training experiences certainly had the potential to shape surgeons' preferences related to scope of practice, lifestyle, and practice locations.

All 37 transcripts were coded according to the final codebook. Transcripts were also annotated with comments, recollections from conducting the interviews, and reasoning behind certain coding. Throughout this coding process, I added to several NVivo memos, commenting on how different codes were evolving, what topics would need clarification, and which codes were most relevant to which research questions. This process of iterative, constant comparison was a key component of engaging in grounded theory (Charmaz, 2014; Corbin & Strauss, 2015; Starks & Trinidad, 2007).

Once initial coding was complete, I utilized the 'coding matrix' query function in NVivo to cross reference interviewees' locations with the interview data. The first query cross-referenced locations with the codes "size big" and "size small," in which interviewees discussed their perceptions of larger places or metro areas and their perceptions of smaller places or rural areas. This resulted in four lists of coded references: currently urban-self/size big, currently

urban-self/size small, currently rural-self/size big, and currently rural-self/size small. “Self” denotes the surgeon’s perception of his or her location, rather than the county’s RUCC code. This way, I was able to separately analyze how surgeons living in urban areas thought about places that were similar to and different from where they lived and how surgeons living in rural areas thought about places that were similar to and different from where they lived. To the side of each coded reference, I wrote a summary or interpretation, also known as “basic themes” (Attride-Stirling, 2001). During this process, a few coded references were identified as being better suited to other codes. They were then uncoded or recoded as appropriate and as agreed upon in discussions with my dissertation chair.

This process of cross-referencing perceived location with other codes was repeated for the codes of social fabric, amenities, and size compare. Then, all basic themes pertaining to the aspects of community considered in practice location decisions were complete. Next, I completed the same cross-referencing process for codes pertaining to other practice location decision factors: partners, identity, recruitment experience, and practice. While other codes also contained valuable data, these were the most relevant to answering the research questions. The final codebook is located in Appendix D.

A Note on General Surgery

The American Board of Surgery (ABS) defines general surgery as:

[A] discipline that requires knowledge of and responsibility for the preoperative, operative, and postoperative management of patients with a broad spectrum of diseases... breadth and depth of this knowledge may vary by disease category. ("Specialty of General Surgery Defined," 2017)

The ABS further stipulated that surgeons who have been certified should have “broad knowledge and experience” across “the alimentary tract, abdomen and its contents; breast, skin and soft tissue; endocrine system. In addition, surgical critical care, surgical oncology, trauma”

("Specialty of General Surgery Defined," 2017). Although these components of the definition of general surgery are broad, they seem relatively clear. However, the ABS continued on and stated general surgeons may have knowledge in even more areas of surgery, though they may require additional training beyond a five-year general surgery residency. In the quantitative portion of this dissertation, surgeons in the AMA MasterFile data specified general surgery was their primary specialty. In the qualitative portion, surgeons identified as general surgeons. In some cases, they had completed fellowship training in more specialized areas, beyond their general surgery residency. Some might say self-identification was not objective enough, but the problem of strictly defining what general surgery is, and who general surgeons are, is not unique to non-clinical researchers like myself. The profession and the public have long struggled to understand and define the profession, too. In a 1981 editorial, Dr. Gardner Smith wrote an editorial in the *Archives of Surgery* saying, "any cocktail-party conversation soon reveals that the lay public has no clear idea of the role of the general surgeon" (Smith, 1981). He went on to assert that general surgeons "need only be competent in the common problems" and "do not need expertise in the management of complex situations that can more properly be referred to other specialists" (Smith, 1981). What is common, then, and what is complex? Who draws these boundaries? As the qualitative data in this dissertation show, usually it is surgeons drawing these boundaries every day, case by case, as they evaluate their own skillsets and their facilities' capabilities and determine which patients will fare best under their care versus another specialist or a sub-specialist, locally or after transfer to another facility. These lived experiences suggest that while the profession continues to work on defining itself, the reality may be that there is no one, single definition of general surgery.

Chapter 2: Critical Literature Review

At the heart of access to care is the presence of providers. For rural Americans, the shortage of physicians is a very real barrier to primary care but even more so to surgical care (Avery & Wallace, 2015; Cogbill et al., 2012; Thompson et al., 2005). Not only are surgical services integral to primary care and non-emergent situations in rural areas, but they are critically important in emergent situations (Avery & Wallace, 2015; Heneghan et al., 2005; Pathman & Ricketts, 2009). There is a shortage and a maldistribution of general surgeons across the U.S., and the profession of surgery recognizes these worsening trends. Efforts undertaken in response to these trends – both in research and in the profession more broadly – fall roughly into two categories: 1) forecasting and supply/demand research, and 2) new approaches to recruitment and curricula in medical school and surgical residencies. The general surgeons and health services researchers working in both these categories have the common goal of preserving and improving patient access to broad-based general surgery services (Fraher et al., 2013; Holmes & Fraher, 2017). Health services researchers have gone beyond simply forecasting and examining medical education; they have investigated the role of personal and community characteristics in physician practice location choice. This is where behavioral economics and sociology add key insights. Behavioral economics offers insights on the role of personal characteristics in these practice location decisions. Sociology adds not only to the role of personal characteristics, but also the role of communities due to the field's focus on social interactions and the importance of place. In fact, some scholars discuss place as a concept that is “difficult to identify or define because of the extension of social relations beyond a locale. Because social relations are dynamic and changing, so too are places” (Cutchin, 1997b).

Here, I critically review the literatures on surgical workforce forecasting, rural surgical education, and the role of personal and community characteristics in light of their relevance to practice location decisions. Because of the similarities of rural areas across developed countries, literature is included from the United States as well as Canada and Australia. In fact, rural surgery and its workforce needs are viewed by the profession at a global level, with the Lancet Commissions: Global Surgery 2030 having produced the most comprehensive examination (Meara et al., 2015; Sheldon et al., 2008).

Work being done in forecasting seeks to predict how many general surgeons there will be in the future and where they may choose to practice (Fraher et al., 2013; Holmes & Fraher, 2017; Ricketts & Fraher, 2013). The supply/demand research seeks to understand whether forecasted supply numbers will match the care Americans will need in the future (Fraher, Knapton, & Holmes, 2017).

Forecasting research is about the workforce pipeline, more specifically graduate medical education (GME) issues such as residency positions by specialty and by state. While this information is needed and has been formulated into important public policy recommendations around GME, it is purely quantitative. It relies heavily on the AMA MasterFile, which has some key limitations. For example, these researchers recognize that the data does not make clear whether physicians are practicing in multiple communities or providing coverage to neighboring rural colleagues (Fraher et al., 2017; Fraher et al., 2013). This level of detail, which is important to have if we are to appropriately address workforce shortages, may only be achievable through field research.

Other researchers who are interested in the workforce pipeline seek to recruit more medical students into general surgery residency programs or change surgery residency training to

include rural rotations (Avery & Wallace, 2015; R. G. Brooks et al., 2002; Cogbill et al., 2012; Doescher, Jackson, Fordyce, & Lynge, 2015). There is significant disagreement in the literature, from authors who are exclusively health services researchers as well as authors who are practicing physicians, about whether personal characteristics or medical education-related factors are the most important in driving future physicians toward certain specialties and certain practice locations. Some hold that any efforts to increase the rural physician supply must focus on increasing the number of medical students who are from rural areas, whereas others believe production of more rural general surgeons can be achieved by developing more rural training opportunities within medical school and residency (Avery & Wallace, 2015; R. G. Brooks et al., 2002; Cogbill et al., 2012; Daniels et al., 2007; Rabinowitz, Diamond, Hojat, & Hazelwood, 1999). Nearly all of this work relies on quantitative data, from medical school admissions demographic data or surveys administered to students during medical school and residency. Very little of this research has yielded qualitative data on students' and residents' deeper attitudes and preferences. One study took advantage of essays written by medical students enrolled in a health policy class to better understand their attitudes toward medical school debt (Phillips, Wilbanks, Salinas, & Doberneck, 2016). The study found that educators may be underestimating what a source of stress medical school debt may be for their students, and we may not be giving enough consideration to the sense of salary entitlement that large student debt produces. Not only is it concerning that research on personal and education-related factors has been primarily quantitative, but this work also only addresses overall physician supply. If overall supply increases without attention being paid to the urban/rural maldistribution, then the maldistribution will persist in spite of greater supply, and no progress will be made toward the alleviation of rural health disparities (Cogbill et al., 2012).

Beyond personal characteristics and training curriculum, health services researchers have compared urban and rural surgeons' motivations for choosing their practice locations. Research has indicated that while quality of life is an area where urban and rural surgeons overlap in their practice location priorities, urban surgeons prioritized economic factors such as income and practice growth more highly than their rural counterparts (Heneghan et al., 2005). In contrast to economic factors prioritized by urban surgeons, work by Hancock and colleagues found that non-economic factors such as "familiarity, sense of place, community involvement, and self-actualization" mattered greatly to rural surgeons in their choice of a rural practice location. Hancock and her colleagues conclude by pointing recruitment efforts toward not only those physicians who were raised in rural areas, but physicians raised anywhere who are also "community-oriented" (Hancock et al., 2009). While the Heneghan study relied on a largely closed-ended survey, the Hancock study was comprised of 22 interviews.

A qualitative study of physicians and key informants in four rural communities in Alberta, Canada, found four themes emerge that positively affected physician retention: "appreciation, connection, active support and physical/recreational assets" (Cameron, Este, & Worthington, 2012). The concepts of appreciation and connection coincide with findings in my preliminary research that indicate the size of a town affects the intensity of the experience of being a practicing rural surgeon. These findings are further supported in the literature on physicians' experiential place integration (Cutchin, 1997a, 1997b; Daniels et al., 2007; Hancock et al., 2009). For example, surgeons find themselves "living life with" their patients, caring for multiple generations of the same families, and crossing paths with patients frequently in everyday life, from high school football games to Wal-Mart. Rather than finding this stifling,

rural surgeons may welcome the way tangible factors, such as town size, interact with the more intangible factors, creating an intense experience of place integration.

This interaction of intangible and tangible characteristics is, essentially, sensemaking on the part of rural surgeons. The concept of sensemaking is commonly found in sociological research but hardly ever referenced in mainstream health services or behavioral economics research. It “involves the ongoing retrospective development of plausible images that rationalize what people are doing” (Weick, Sutcliffe, & Obstfeld, 2005). Experiential place integration is also primarily a sociological term that describes how an “interlocking and continuous set of actions creates a situation of emerging experience” (Cutchin, 1997b). This concept has made its way into physician workforce research, particularly regarding retention, where research suggests sensemaking and experiential place integration play a part in practice location decisions through the mechanisms of professional identity and satisfaction (Cutchin, 1997a, 1997b). These sociological concepts are highly relevant as we work to understand and improve rural general surgeon recruitment and retention, increase access to rural surgical services, and decrease rural health disparities.

While health services literature does not frequently discuss sociological concepts, there is evidence showing economic interests are not the only relevant interests in physician recruitment and retention, validating the need to explore non-economic, social concepts. Buykx and colleagues found that while recruitment packages are usually financial in nature, the financial considerations are often secondary to lifestyle concerns (Buykx, Humphreys, Wakerman, & Pashen, 2010). Similarly, Cogbill and colleagues maintain that recruitment packages must account for lifestyle concerns and address call coverage and vacation time (Cogbill et al., 2012). Lifestyle considerations during the recruitment process continue through retention as well. In a

Canadian study, researchers found income was not physicians' primary consideration in deciding to stay in their rural practice location. Instead, their and their families' contentment mattered most, and it manifested itself in various ways (Mayo & Mathews, 2006). This evidence links to work by behavioral economists who have pointed out that attitudes, beliefs, and preferences are instrumental in decision-making (Ariely, Loewenstein, & Prelec, 2005; Ariely & Norton, 2007).

Conceptually, the role of attitudes, beliefs, and preferences is inextricable from the role of family, particularly spouses, due to the significant role such close personal relationships play in the formation and continual evolution of a person's identity, including their attitudes, beliefs, and preferences. The literature on spousal involvement in physicians' practice location decisions tends to focus on general practitioners, family physicians, or all physicians. The focus is also usually on factors affecting rural choice in particular, although some work has examined the rural versus urban choice. The research on spousal influences on surgeons specifically and on rural surgeon practice location decisions is underdeveloped. Research by Parker and colleagues in 1978 found that 27 percent of survey respondents indicated, "your spouse had connections in your area or was attracted to it." However, these spousal connections or attraction to an area did not surpass in importance factors such as professional support, the economics of a medical practice, or the physician's own predisposition toward rural practice. These researchers also found that spousal influence was important to a smaller proportion than anticipated (Parker & Sorenson, 1978). In the 1980s, Carter and colleagues found that both physicians and their spouses having non-urban backgrounds was important in rural practice location choice, implying a team approach to this decision-making process (Carter, 1987). Then, most recent work published in 2010 focused on Generation X physicians in particular, finding through interviews

that work opportunities for spouses were very important in these physicians' practice location decisions (Laurence, Williamson, Sumner, & Fleming, 2010).

Research by Rabinowitz acknowledges spouses are important, but states only three factors are consistently predictive of choosing rural practice: rural upbringing, an intention to practice rurally at the outset of medical training, and an intention to go into family medicine (Rabinowitz et al., 1999; Rabinowitz, Diamond, Markham, & Santana, 2012). Spouses are consistently viewed as 'external' factors or as secondary in importance to physicians' own characteristics across the literature. Factors related to spouses span a wide range, from the importance of work opportunities to whether spouses grew up in a rural area to the vague 'spousal satisfaction' (Carter, 1987; Laurence et al., 2010; Rabinowitz et al., 2012). Spousal satisfaction, in turn, is affected by a number of factors, including "physician workload and community integration" (Mayo & Mathews, 2006). This conclusion suggests a somewhat circular process. Physicians take their spouses' opinions into consideration, a practice location is chosen, the workload may be high, then the spouse is dissatisfied, the physician takes that dissatisfaction into account, and the decision-making process begins again. Researchers in this field acknowledge personal factors, including the spousal relationship, are difficult – if not impossible – to address through public policy (Mayo & Mathews, 2006). Even if they could be addressed, there remains the question of whether that is an appropriate space in which public policy should intervene. This sort of circular decision-making process and the difficulty of addressing this through public policy makes the principles of behavioral economics all the more important to incorporate in this dissertation.

Where economics tells us people are rational actors who make decisions based on optimization, behavioral economics tells us instead that people have systematic biases (Samson,

2017; Thaler, 2016). The very definitions of ‘cost’ and ‘benefit’ are subjective, making a purely objective cost/benefit analysis impractical. In other words, these are systematic errors, making accurate quantitative modeling of human decisions in the positivist research tradition nearly impossible (Thaler, 2016). Among these systematic biases is status quo bias, which is the fact that humans generally value the present state more than they value the future (Samson, 2017). It is difficult for humans to imagine the future and imagine that it might be better than the present, so they cling to the present because it is what is known. Status quo bias ties into general surgeon workforce research because of the prevalent focus on rural surgeons having been raised in rural areas (Avery & Wallace, 2015). In essence, those physicians from a rural background tend to practice in rural areas because such a setting is the status quo. One study correlates to this behavioral economics concept in its finding that familiarity is a strong motivation among surgeons who have chosen rural practice locations (Hancock et al., 2009).

Recently, economists have examined the role of amenities in the phenomenon of professionals “sorting” themselves into urban and rural locations (Diamond, 2016; Moretti, 2012). These amenities, such as schools, parks, and retail services are measurable variables that can begin to speak to lifestyle factors’ effects on career decisions, including surgeons’ practice location decisions. Amenities are one aspect of ‘place,’ a concept explored in detail by sociologists, particularly for its role in the shaping of human purpose and identity (Cutchin, 1997a, 1997b). The fields of behavioral economics and sociology intersect with each other and with health services research in physician recruitment and retention (Ahmed et al., 2012; R. G. Brooks et al., 2002; Hancock et al., 2009; Pathman, Konrad, Dann, & Koch, 2004).

Part II: Quantitative Findings

Introduction to the Quantitative Findings

In this mixed methods study, the purpose of the quantitative analyses was to understand the distribution of Midwestern general surgeons among urban and rural areas and understand the role these surgeons' basic characteristics may play in their choosing a rural surgical practice. I achieved this understanding by answering Research Question 1a and Research Question 1b. The first, 1a, was "What individual characteristics are unique to general surgeons who grew up in an urban area and now practice rurally (urban-rural movers) compared to their peers?" First, I described the dataset using univariate tests, then I tested the relevance of certain differences between rural and urban surgeons using bivariate analyses. Next, I presented the results of a multi-variate regression analysis examining all general surgeons in the dataset and predicting whether they are in a rural practice location. Co-variables in this regression and the main analysis were broken into three categories: demographics, trainings, and current practice.

The main analysis for 1a was a multi-variate regression model using only urban-born surgeons and predicting whether they are in a rural practice location. Most surgeons currently practice in urban areas (Lynge & Larson, 2009), most medical education and surgical training programs are located there (Doty & Zuckerman, 2009), and about 80 percent of the population lives there (Avery & Wallace, 2015). Urban areas, therefore, have the largest pool of potential future rural surgeons, and this analysis helps us understand why a surgeon might become an urban-rural mover. It helps us understand the relevance of inherent characteristics, such as demographics, as well as different points in time along the workforce pipeline, such as training locations. Table 5 lists the co-variables in each category.

Table 5: Dependent and Independent Variables in Physician-Level Analyses

Dependent variable , preliminary analysis: (all general surgeons)	Indicator for rural practice location (0 = urban, 1 = rural)
Dependent variable , main analysis: (dataset narrowed to urban-born surgeons)	Indicator for being an urban-rural mover (0 = any other type of mover or stayer, 1 = urban-rural mover)
Independent variables , both analyses:	Demographics Rurality of birth city Age Female Training MD vs. DO (0/1) Medical school in RUCC ≥ 3 Residency in RUCC ≥ 3 Medical school in the Midwest (0/1) Residency in the Midwest (0/1) Current practice Primary responsibility is patient care (0/1)

As an extension to the main model, I presented the results of a multi-variate regression using only rural-born surgeons and predicting whether they were in a rural practice location: whether they were a rural-rural stayer. The main analysis and this extension model both had rural practice as the outcome of interest. By using two different surgeon populations – urban-born in the main and rural-born in the extension – I explored what traits predicted rural practice for both populations versus what traits may only have been relevant for one or the other. If the main analysis results were consistent with the extension model results, it would indicate observable characteristics could predict rural practice for both urban and rural-born surgeons in similar ways. If the results were inconsistent, it would suggest that urban-born and rural-born surgeons had different reasons for seeking rural practice. Understanding these similarities and differences is important in the practical application of these results as communities work to formulate more effective surgeon recruitment and retention efforts. These findings from Research Question 1a allowed us to understand better what individual-level factors may make a surgeon inclined

practice rurally, whereas Research Question 1b explored what characteristics of a rural community may be able to attract surgeons.

Research Question 1b was, “What characteristics are unique to rural communities where urban-rural movers are located versus where they are not?” After establishing which individual surgeon traits are associated with choosing a rural practice location, I presented an analysis of community characteristics to answer 1b. The dataset was narrowed to rural counties only, and the outcome variable indicated the presence of at least one urban-rural mover surgeon. This allowed me to separate rural counties into two groups: the group that not only has a surgeon but has a surgeon from an urban area, and the groups that has either no surgeon or only surgeons originally from rural areas. Then, I conducted multi-variate analysis to see how these two groups might be different. Previous works have studied the migration patterns of physicians and surgeons, showing that they do tend to locate in places with supportive medical communities and healthy local economies (McGrail, Humphreys, Joyce, Scott, & Kalb, 2011; McGrail et al., 2017; Ricketts, 2010, 2013). This dissertation, however, examined general surgeons specifically and segmented them by point of origin in a way that previous research had not. While it explored community characteristics that some previous research had as well (Diamond, 2016; Langwell, Drabek, Nelson, & Lenk, 1987; MacQueen et al., 2018; McGrail et al., 2017), the segmentation and comparison of rural counties according to their recruitment of surgeons from a specific point of origin (urban) was new. The co-variables were broken into three categories: community demographics, health resources, and amenities (see Chapter 4, Table 20). These categories were analyzed in three different multi-variate regression models and one final, comprehensive model to determine which variables may be important factors in urban-born surgeons’ decisions to practice in certain rural communities.

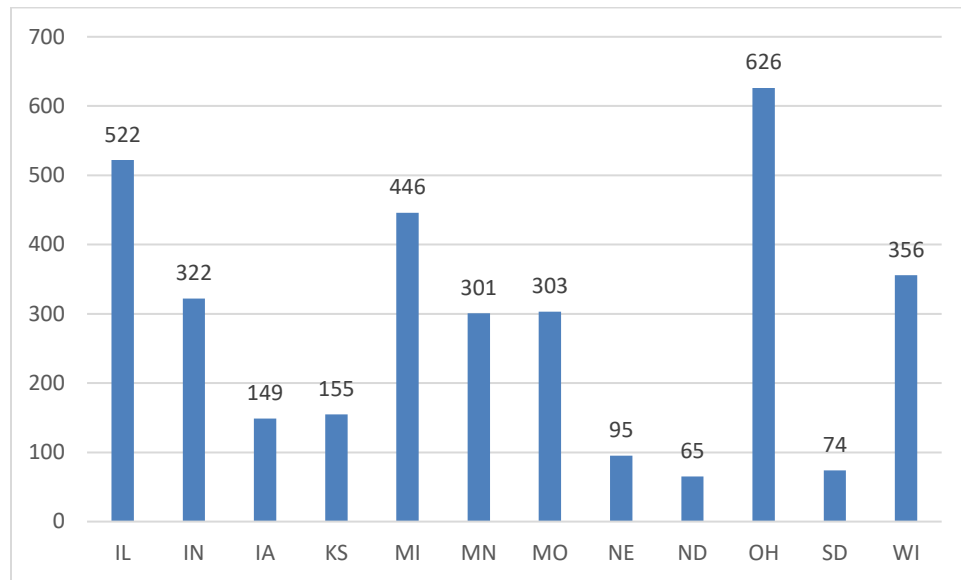
Chapter 3: Who Leaves and Who Stays

Univariate and Bivariate Analyses

Univariate and bivariate analyses were conducted for all variables in the three categories – demographics, training, and current practice – regardless of whether they were included in the final multi-variate model. Before examining the co-variables, I presented basic information about the geographic locations of surgeons in the sample.

This sample was split 66.6% and 33.5% between general surgeons in the east north central Census sub-region of the Midwest and the west north central Census sub-region of the Midwest. This was not surprising considering the eastern sub-region included more populous states such as Illinois, with the urban center of Chicago; the other states in the sub-region were Indiana, Michigan, Ohio, and Wisconsin. Ohio had the highest percentage of surgeons in the sample at 18.3%, followed by Illinois with 15.3%. The more rural states of the region made up the western sub-region; they were: Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, and South Dakota. The state in this sub-region with the highest percentage of sampled surgeons was Missouri at 8.9%. Of the 3,230 counties in the AHRF, 1,005 were located in these 12 Midwestern states. Figure 3 shows the distribution of surgeons by state in the Midwest.

Figure 3: Surgeons by State



Demographics. There were 3,414 general surgeons in the final sample. It should be noted that had foreign-born surgeons make up 24.9% of all Midwestern general surgeons ($n = 1,131$), so had they been included, the sample would have grown to 4,545. Unfortunately, since foreign countries do not use measures of rurality that easily translate to the RUCC classification system, and since this analysis revolves around the concepts of movers and stayers which hinges on assigning rurality, it was most logical to exclude foreign-born surgeons. Given their significant role in the Midwestern surgical workforce, they deserve additional study.

The 3,414 general surgeons remaining in the sample were distributed across rural and urban birth and current counties as shown in Table 6. Additional demographics of the sample are shown in Table 7.

Table 6: Birth and Current Counties by Urban vs. Rural

	Birth County	Current Practice County
Urban	2,771 (81.2%)	2,780 (81.4%)
Rural	545 (16.0%)	634 (18.6%)
Data not available	98 (2.9%)	0 (0%)
	3,414 (100.0%)	3,414 (100.0%)

Table 7: Select Demographic Statistics

Sex		
Male	2,708	79.3%
Female	706	20.7%
	3,414	100.0%
Aging (Approaching Retirement)		
Under 55 years of age	1,822	53.4%
55 years of age or older	1,592	46.6%
Census Division		
Eastern Midwest	2,272	66.6%
Western Midwest	1,142	33.5%

Age		
Range	28 - 93	
Mean	53	
Median	54	
Aging (Retirement)		
Under 65 years of age	2,840	83.2%
65 years of age or older	574	16.8%
Address Type		
Office	1,793	52.5%
Home	1,604	47.0%
Other	17	0.5%

As Table 6 shows, 2,780 Midwestern general surgeons (81.4%) were practicing in urban counties, defined throughout this dissertation as an RUCC of 3 or smaller, and the remaining 634 (18.6%) practiced in rural counties. In the RUCC methodology, classifications of 1, 2, and 3 were grouped together and defined as “metropolitan” and generally included communities of 250,000 people and greater ("Rural-urban continuum code, 2013," 2013). Movers – surgeons who were practicing in a location unlike where they were born – comprised 23.2% of this sample (n=2,524), and the remaining 73.9% (n=792) were stayers. I was unable to categorize the 98 surgeons without birth location data as either movers or stayers. When movers and stayers were divided into urban-rural movers, rural-urban movers, urban-urban stayers, and rural-rural stayers, they were distributed as described in Table 8:

Table 8: Distribution of Types of Movers and Stayers

Type of Mover or Stayer (Born-Current)	Number (Percentage of Sample)
Urban-urban stayer	2,335 (68.4%)
Rural-rural stayer	189 (5.5%)
Urban-rural mover	436 (12.8%)
Rural-urban mover	356 (10.4%)
Missing data to calculate mover or stayer	98 (2.9%)
Sum	3,414 (100.0%)

The distribution was quite skewed toward urban-urban stayers since they made up more than two-thirds of the sample. It followed, then, that when I calculated the average RUCC of surgeons' birth counties among currently-practicing urban and rural surgeons, those means were small, indicating more urban locations. Yet, they were still statistically significantly different. Currently-urban surgeons, on average, were born in counties with an RUCC of 2.0, whereas rural surgeons, on average, were born in counties with an RUCC of 2.9 ($p = 0.000$). The value 2.9 placed them on the cusp of rural since counties with an RUCC of 3 were considered urban in this analysis, and counties of 4 and greater were rural. When this t-test was reversed, and I tested the average RUCC for current practice locations for urban-born versus rural-born surgeons, the averages shifted toward slightly more rural. Urban-born surgeons were, on average, practicing in counties with an RUCC of 2.2, whereas rural-born surgeons were, on average, practicing in counties with an RUCC of 3.2 ($p = 0.000$). This placed rural-born surgeons just over the threshold for rural practice on average.

When the sample was divided into two groups according to urban versus rural birth location, the proportions of movers and stayers in each were notable. Their distributions are shown in Tables 9 and 10.

Table 9: Distribution of Urban-born Surgeons

Type of Mover or Stayer (Born-Current)	Number (Percentage of Urban-born Surgeons)
Urban-urban stayer	2,335 (84.3%)
Urban-rural mover	436 (15.7%)
Sum	2,771 (100.0%)

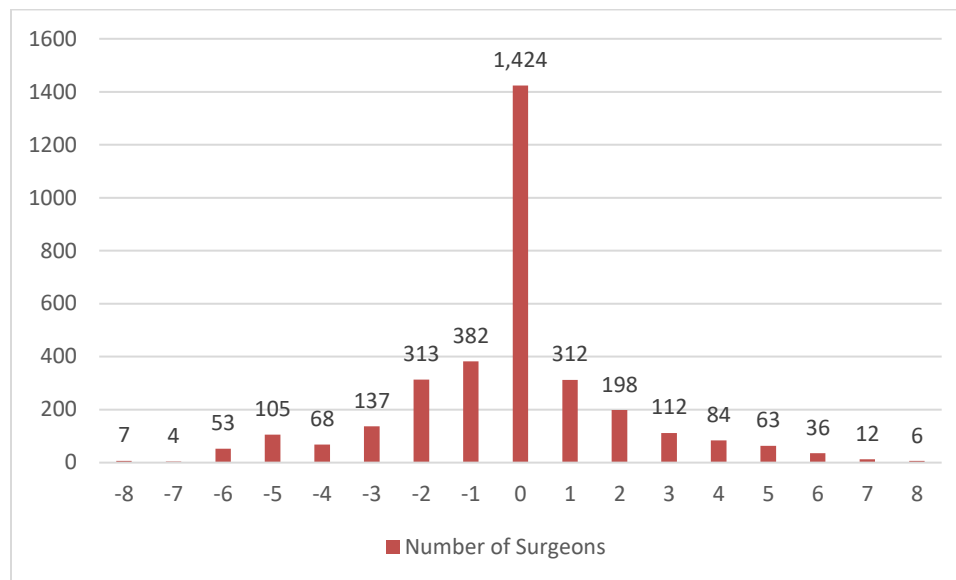
Table 10: Distribution of Rural-born Surgeons

Type of Mover or Stayer (Born-Current)	Number (Percentage of Rural-born Surgeons)
Rural-rural stayer	189 (35.7%)
Rural-urban mover	356 (65.3%)
Sum	545 (100.0%)

It is important to note that nearly all surgeons have exposure to urban areas during medical school or residency, as almost all medical education and surgical training takes place in urban locations (Doty & Zuckerman, 2009). For those born in urban areas, therefore, they may not ever be exposed to life and surgical practice in a more rural area. Rural-born surgeons, on the other hand, are exposed to rural areas while growing up and then experience urban life during training; they gain experience with both types of areas. This could account for the high proportion of urban-born surgeons who stay in urban areas (84.3%) and the high proportion of rural-born surgeons who practice in urban areas (65.3%). This reinforces why rurality of birth location and rurality of training location have been included in these analyses: these variables pertain to surgeon's exposure to different types of communities. In the entire sample, birth rurality was correlated with current rurality at 18.8%. When the sample was limited to urban-born surgeons, this correlation is weaker, at 3.7%.

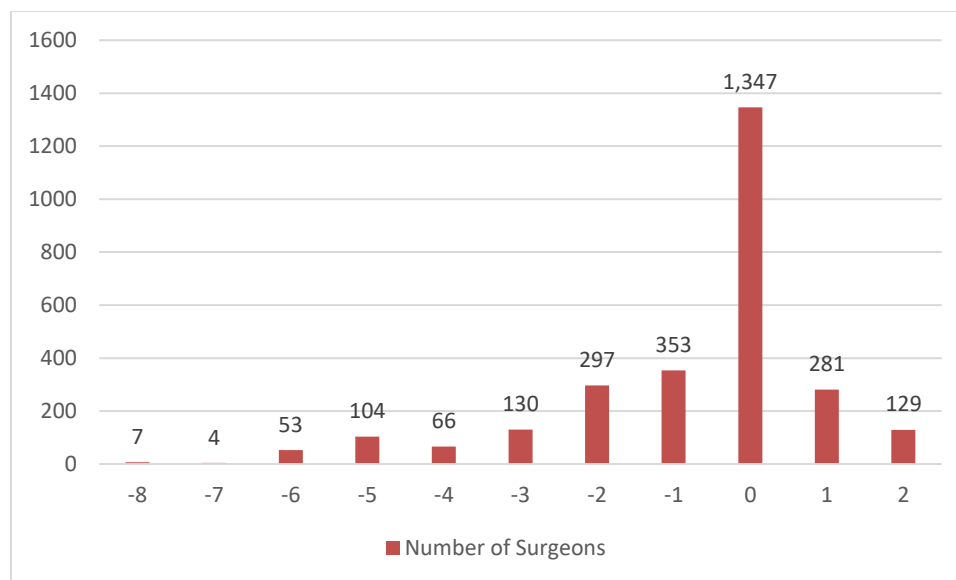
Figure 4 depicts the number of surgeons that moved or stayed according to the difference between their birth RUCC and their current practice RUCC. A value of 0, therefore, indicates they have stayed in the same type of environment, whether that be 1 to 1 or 9 to 9. Values of -8 and 8 on the other hand, represent movement from either the most urban environment (RUCC=1) to the most rural (RUCC=9), or vice versa, respectively.

Figure 4: Moving and Staying Between RUCCs: Full Sample



When the sample was narrowed only to urban-born surgeons, as it was for the main multi-variate analysis, this distribution shifted, as depicted in Figure 5.

Figure 5: Moving and Staying Between RUCCs: Urban-born Surgeons Only



Although being born and practicing in a county with the same RUCC remained the most common occurrence (a value of 0, $n=1,347$), there were no values for 3 through 8. This was because being urban-born restricts the birth RUCC value to 1-3; therefore, the values -8 through

-1 indicate urban-rural movers, the value 0 indicates urban-urban stayers, and values 1-2 indicate urban-urban stayers who practicing in an even more urban area than where they were born.

In terms of basic demographics, most Midwestern general surgeons ranged in age from 40 to 69. When age was examined in decade increments, younger general surgeons were more likely to practice in urban counties, with only 15.0% of those in their 30s and 13.7% of those in their 40s practicing in rural areas. This percentage increased to 19.6% for those in their 50s, 23.8% for those in their 60s, and fell slightly to 22.3% for those in their 70s. These data were consistent with previous findings that rural surgeons tended to be older than their urban counterparts. This age difference suggested that rural surgeons, on average, would be retiring sooner than urban surgeons, necessitating the recruitment of their replacements. In this sample, the average age of an urban county surgeon was 52.6, whereas it was 55.1 for rural surgeons. Using a Student t-test, this difference in means was statistically significant at the $p = 0.000$ level. Since later multi-variate regression analyses compared urban-rural movers to urban-urban stayers and then compared rural-rural stayers to rural-urban movers, I conducted Student t-tests on age to mirror these comparisons. Among urban-born surgeons, those who practiced in urban areas (urban-urban stayers) were an average of 52.8 years old. Those who were practicing rurally (urban-rural movers) were an average of 55.8 years old, a difference of three years. These means were statistically significantly different ($p = 0.000$). Among rural surgeons, however, there was no such difference between movers and stayers. Those who were rural-urban movers were 53.2 years old on average, and those who were rural-rural stayers were 53.9 years old, a difference of only 0.7 or about 8 months ($p = 0.538$).

In this sample, 706 (20.7%) of the general surgeons were identified as women, and the remaining 2,708 (79.3%) were identified as men. Consistent with the trend of more women

entering surgical professions over time, these data showed women comprised 38.6% of Midwestern general surgeons in their 30s and 27.3% of those in their 40s. This percentage fell to 17.4% for those in their 50s, 11.0% for those in their 60s, and only 6.8% of those in their 70s. Across all ages and regardless of where they were born, 12.5% of women had chosen rural practice, whereas 20.2% of men had. A Student t-test showed this difference was significant at the $p = 0.000$ level. When narrowed to urban-born surgeons, 22.4% of those practicing in urban areas (urban-urban stayers) were women. Of those who were practicing rurally (urban-rural movers), only 12.6% were women. These means were statistically significantly different ($p = 0.000$). Among rural-born surgeons, however, there was no such difference. Of those who were rural-urban movers, 19.9% were women, and of those who are rural-rural stayers, 16.4% were women. This was a difference of 3.5 percentage points, but it was not statistically significant ($p = 0.314$). To summarize, the proportion of women in surgery was growing over time; however, most were practicing in urban areas regardless of whether they were born in urban or rural areas.

Since this dissertation was limited to general surgeons practicing in the Midwest, it was logical to examine how many were also born in the Midwest. This was an additional dimension of the “movement” concept. Not only was I considering whether surgeons had moved between similarly urban or rural places or not, but I also considered whether they moved into the region from another part of the U.S. In the entire sample, 68.8% of the surgeons were born in the Midwest. Of those in rural practice, a slightly higher proportion were native Midwesterners, at 72.3%, compared to those in urban practice, of whom 69.3% were native Midwesterners. However, this difference in means was not statistically significant ($p = 0.146$) according to a Student t-test. This variable for birth region was highly correlated with having completed

medical school in the Midwest; therefore, it was removed from further analyses on the basis that conceptually, training variables were more important in practice location decisions.

Table 11: Demographic Variables

	All Surgeons	Urban Surgeons	Rural Surgeons	p-value (urban vs. rural)
Age (average)	53.1	52.6	55.1	0.000***
Women (% of total)	20.7%	22.2%	13.9%	0.000***
Rurality of birth city (% rural)	16.0%	13.2%	30.2%	0.000***
Born in Midwest	68.8%	69.3%	72.3%	0.146

Training. While 96.7% of the general surgeons in this sample were medical doctors (MDs), 3.3% were doctors of osteopathy (DOs). Though they made up a small percentage of all Midwestern general surgeons, 33.6% of these DOs practiced in a rural county, as opposed to 18.1% of MDs. Using a Student t-test, the difference between these means was statistically significant at the $p = 0.000$ level. However, given the difference between the underlying numbers – there were 38 rural DO general surgeons and 596 rural MD general surgeons in the sample – statistics relying on measures of centrality are of little use. Moving forward, DOs were included in multi-variate modeling, but their small number was taken into account in discussion and practical application of the results.

Although the majority of medical schools and graduate medical education training programs, or residencies, are in urban centers, enough surgeons in this sample completed their education or training in less urban areas to warrant examination of the rurality of training locations. The term “less urban” was used here to denote a different cut-point in RUCCs for this portion of the analysis. Training locations in counties with an RUCC of 1 or 2, what some might call true metropolitan areas, were defined as urban, whereas locations in counties with an RUCC of 3 or higher were defined as less urban. In this sample, 86.0% of surgeons completed medical school in an urban area, and the remaining 11.3% completed their medical or osteopathic degrees

in less urban areas. The difference was slightly greater for residency locations. 89.9% of surgeons completed residency in an urban area, and 10.0% completed residency in a less urban area. When these training locations were compared against current practice locations in a Student t-test, their rurality was statistically significant in relationship to a rural practice location ($p = 0.000$). Among surgeons currently in rural practice, 15.5% completed medical school in a less urban area compared to 10.7% of those currently in urban practice. Similarly, of those in rural practice, 17.0% completed residency in less urban areas compared to only 8.4% of those in urban practice ($p = 0.000$).

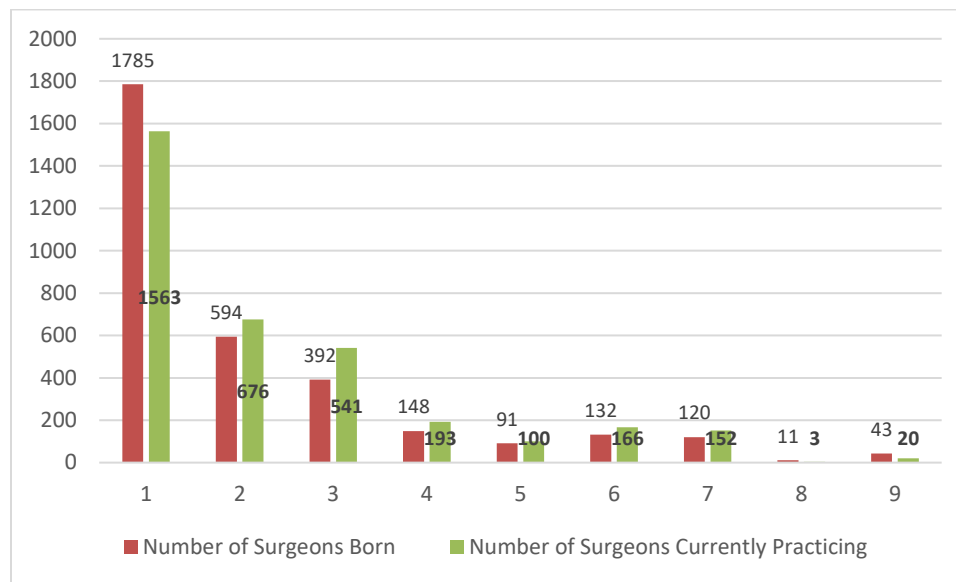
As stated regarding surgeons having been born in the Midwest, conceptually it is important to consider how many surgeons have come from outside the region, when, and whether region was important in urban versus rural practice location choice. Among the training variables, I constructed an indicator for whether surgeons completed medical school in the Midwest and whether or not they completed residency in the Midwest. Across the sample, 72.5% completed medical school and 73.0% completed residency in the Midwest. There was no statistically significant difference in means between urban and rural surgeons for either of these variables, as detailed in Table 12. The proportion of surgeons who completed their medical education and surgical training in the region remained high, over 70.0%, even after having divided them between currently-urban and currently-rural locations.

Table 12: Training Variables

	All Surgeons	Urban Surgeons	Rural Surgeons	p-value (urban vs. rural)
DOs (% of total)	3.3%	2.7%	6.0%	0.000***
Medical school in RUCC ≥ 3 (% yes)	11.3%	10.7%	15.5%	0.001**
Residency in RUCC ≥ 3 (% yes)	9.9%	8.4%	17.0%	0.000***
Medical school in the Midwest (% yes)	72.5%	74.3%	76.5%	0.244
Residency in the Midwest (% yes)	73.0%	74.0%	70.3%	0.056

Current Practice. As demonstrated in Figure 6, the rurality of Midwestern general surgeons' practice locations was skewed toward the more urban counties (RUCC 1-3). When compared to the rurality of their birth locations, the most urban areas experienced a net loss, whereas counties between RUCC 2 and 7, inclusive, experienced net gains. The most rural counties, RUCC 8 and 9, experienced net losses, though both the numbers of surgeons born in such counties and the numbers currently practicing were all quite low. In the preliminary multivariate analysis, having a rural practice location was the outcome variable, and in the main analysis, the outcome was a surgeon being an urban-rural mover, which also meant having a rural practice location. Therefore, no bivariate tests were conducted on current practice rurality.

Figure 6: Birth vs. Current RUCC



In the AMA MasterFile, physicians were asked to list their secondary specialty. This information was important because the scope of surgical practice in rural areas has been proven to be significantly different from urban practice (Doty et al., 2006; Doty & Zuckerman, 2009; Heneghan et al., 2005; Valentine et al., 2011). If a general surgeon was branching out beyond surgery and into medical specialties, that was important to know. Only 40 surgeons in the sample were missing data in this field; however, 2,702 surgeons listed “unspecified specialty.” This proved problematic as I created a variable for whether Midwestern general surgeons had a secondary specialty that was non-surgical or surgical. When the “unspecified specialty” surgeons were included with those with a non-surgical secondary specialty, the result was that only 506 (14.8%) of the sample had a surgical secondary specialty. A Student t-test was conducted comparing the mean percentage of urban surgeons listing a surgical secondary specialty (15.4%) to rural (13.2%), and the difference in means was not significant ($p=0.156$). Because of the problematic “unspecified specialty” response, this variable was not included in multi-variate analyses.

The last current practice variable examined was an indicator for a surgeon's primary responsibility being patient care. In the AMA MasterFile, physicians had several possible responses for this question, such as teaching, research, and administration. Given the high concentration of medical education and training in urban areas, it was important to account for the possibility of greater academic responsibilities among urban surgeons and the possibility that those who chose rural practice might have had less interest in an academic career. 90.0% of surgeons were in direct patient care, and in rural areas, 97.5% ($p = 0.000$). Although this difference in means was statistically significant according to a Student t-test, both percentages were very high. Going forward in this dissertation, it was important to remember that both urban and rural surgeons in this sample are, more than 9 out of 10 times, primarily engaged in patient care.

Table 13: Current Practice Variables

	All Surgeons	Urban Surgeons	Rural Surgeons	p-value (urban vs. rural)
Rurality of current practice location (% yes)	18.6%	n/a	100.0%	n/a
Secondary specialty (% specified as surgical)*	14.8%	15.4%	13.2%	0.156
Primary responsibility is patient care (% yes)	91.4%	90.0%	97.5%	0.000***

**Over 2,000 surgeons listed "unspecified specialty" for secondary specialty, which has been coded as "0" for non-surgical secondary specialty. This percentage represents surgeons who have specifically identified their secondary specialty as surgical.*

Multi-Variate Analyses

To further examine the relationship between surgeon-level variables and the outcome of a rural practice location, multi-variate regression analyses were completed. This first model included all 3,414 surgeons, and the outcome variable was having a rural practice location. As stated earlier, this meant practicing in a county with an RUCC of 4 or greater. This was a

preliminary analysis to understand what factors could be associated with having chosen a rural surgical practice. Then, the dataset was narrowed only to urban-born surgeons, and the outcome variable was being an urban-rural mover, in other words, having a rural practice location. The goal was to determine whether urban-rural movers were different in measurable ways from urban-urban stayers. This helped answer whether there were surgeon-level characteristics that pushed surgeons toward a rural practice.

Preliminary Analysis: All General Surgeons. The entire sample of 3,414 Midwestern general surgeons was used in this preliminary multi-variate regression analysis. The dependent, or outcome variable, was a binary indicator for rural practice, wherein 1 signified a surgeon practicing in a county with an RUCC of 4 or greater. I used a linear probability model, which produced beta coefficients estimating the percentage-point changes in the means of the independent variables associated with movement in the dependent variable from 0 to 1. When all 9 independent variables were added, the model retained 3,215 observations, or 94.2% of the sample. Nearly every co-variate was found to be statistically significant at the $p < 0.01$ level. Details are provided in Table 14.

Table 14: Preliminary Analysis: Results from Multi-variate Linear Regression Model

<i>Source</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>Number of obs</i>	3,215
				F(9, 3205)	26.35
<i>Model</i>	33.833	9	3.759	Prob > F	0.000
<i>Residual</i>	457.318	3,205	0.143	R-squared	0.069
				Adj R-squared	0.066
<i>Total</i>	491.151	3,214	0.153	Root MSE	0.378

<i>Outcome: Surgeon practices in a rural county</i>	Coef.	Std. Err.	T	P>t	[95% CI]	
<i>Rurality of birth county</i>	0.038	0.004	9.950	0.000***	0.030	0.045
<i>Age</i>	0.002	0.001	3.810	0.000***	0.001	0.003
<i>Female</i>	-0.052	0.017	-3.050	0.002**	-0.085	-0.019
<i>MD (0) / DO (1)</i>	0.156	0.039	4.020	0.000***	0.080	0.231
<i>Less urban medical school (1 = yes)</i>	-0.009	0.022	-0.390	0.698	-0.052	0.035
<i>Less urban residency (yes = 1)</i>	0.131	0.023	5.640	0.000***	0.085	0.176
<i>Medical school in the Midwest (yes = 1)</i>	0.012	0.017	0.730	0.464	-0.020	0.045
<i>Residency in the Midwest (yes = 1)</i>	-0.058	0.016	-3.580	0.000***	-0.090	-0.026
<i>Primary responsibility is patient care (yes = 1)</i>	0.116	0.024	4.800	0.000***	0.068	0.163
<i>Constant</i>	-0.096	0.041	-2.330	0.020	-0.177	-0.015

The only variables not statistically significant in rural practice location were having graduated from a less urban medical school and having graduated from a medical school in the Midwest. This was not explained by collinearity, as attending a less urban medical school and a medical school in the Midwest were only correlated at 11.5%. All three demographic variables – rurality of birth county, age, and sex – were significant at $p < 0.01$ levels. This suggests that those in rural practice typically were born in more rural counties; however, the effect size was small. The results also showed that surgeons in rural practice tended to be older and male, though again, the effect sizes were small. The percentage of surgeons in rural surgical practice who were DOs was 15.6 percentage points higher than the overall average ($p = 0.000$). The mean percentage of those who completed a less urban residency was 13.1 percentage points higher among those in rural

practice ($p = 0.000$), and the average percentage of surgeons primarily in patient care was 11.6 percentage points higher among those in rural practice. Given that both urban and rural surgeons were nearly all primarily in patient care, the statistical significance of this variable may not translate to practical significance. It is possible that patient care-centric work is more prevalent in rural areas and is not, in fact, a reflection of any physician-level characteristic predicting his or her choosing a rural practice. As a check the potential endogeneity of this variable, the model was re-run without it. Beta coefficients' sizes, directionality, and statistical significance were not meaningfully affected.

Also, given the small number of DO surgeons overall, the fact that they were more likely to be in rural practice may or may not be practically significant depending on the degrees and trainings rural communities are seeking when they recruit surgeons. It was not clear why completing residency in the Midwest had a negative beta coefficient, although it was very small. It was possible that this result was affected by correlation with attending medical school in the Midwest; attending a Midwestern medical school and attending a Midwestern residency program were correlated at 34.8%. Overall, though the model was significant, with an F-statistic of 0.000, it had very low explanatory power, with an adjusted R-squared value of only 6.6%. This suggested that at least 93.4% of the variation between urban and rural surgeons could be explained by factors other than those included in this model.

To further investigate birth rurality, I repeated this regression with each individual birth RUCC classification regressed separately, and these results are located in Table 15. The only classification that was not significant in relationship to the most urban type of county (RUCC = 1) was RUCC 3; examples of cities within counties at this level are Topeka, KS; Columbia, MO; and Rochester, MN. While effect size was small for RUCC 2, it increased to 10.0 percentage

points for RUCC 4, then doubled to nearly 20.0 percentage points for RUCCs 5 and 6. There was a further increase at RUCC 7, then a near-doubling to 40.1 percentage points for RUCC 3. The effect decreased only slightly as rurality increased to an RUCC of 9, at 31.3 percentage points. Those born in counties with an RUCC of 8 or 9 were far more likely to practice in a rural area than those born in the most urban of counties (RUCC 1).

Table 15: Preliminary Analysis: Excerpted Individual RUCC Classifications

RUCC (in relationship to RUCC = 1, the most urban)	Beta coefficient	p-value
2	0.046	0.012*
3	0.010	0.651
4	0.106	0.001**
5	0.194	0.000***
6	0.183	0.000***
7	0.224	0.000***
8	0.401	0.000***
9	0.313	0.000***

Having established the importance of demographics, type of medical degree, rurality of residency, and being primarily in a patient care role in whether a surgeon practiced rurally, I moved on to the main analysis, investigating only urban-born surgeons.

Main Analysis: Urban-born General Surgeons. The dataset was limited to urban-born surgeons only since they represent the largest pool of potential, future rural surgeons. This reduced the number of observations to 2,771, which was 81.2% of the full sample. The outcome variable was changed to an indicator variable for whether or not the surgeon was an urban-rural mover, separating this type of urban-born surgeon from those who were urban-urban stayers. The same co-variates were applied, and similar results were found as in the preliminary analysis with a few notable exceptions. The number of observations remained high, at 2,679, which was 96.7% of the reduced sample. Full results are located in Table 16.

Table 16: Main Analysis: Results from Multi-variate Linear Regression Model

<i>Source</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>Number of obs</i>	2,679
				F(9, 2669)	12.91
<i>Model</i>	14.770	9	1.6411	Prob > F	0.000
<i>Residual</i>	339.385	2,669	0.1272	R-squared	0.042
				Adj R-squared	0.039
<i>Total</i>	354.155	2,678	0.1322	Root MSE	0.357

<i>Outcome: Surgeon is an urban-rural mover</i>	Coef.	Std. Err.	T	P>t	[95% CI]	
<i>Rurality of birth county</i>	0.011	0.010	1.130	0.260	-0.008	0.030
<i>Age</i>	0.003	0.001	4.060	0.000***	0.001	0.004
<i>Female</i>	-0.056	0.018	-3.220	0.001**	-0.091	-0.022
<i>MD (0) / DO (1)</i>	0.169	0.041	4.120	0.000***	0.088	0.249
<i>Less urban medical school (1 = yes)</i>	0.036	0.025	1.440	0.151	-0.013	0.085
<i>Less urban residency (yes = 1)</i>	0.137	0.025	5.400	0.000***	0.087	0.187
<i>Medical school in the Midwest (yes = 1)</i>	-0.003	0.017	-0.190	0.853	-0.036	0.030
<i>Residency in the Midwest (yes = 1)</i>	-0.037	0.017	-2.240	0.025*	-0.070	-0.005
<i>Primary responsibility is patient care (yes = 1)</i>	0.102	0.025	4.130	0.000***	0.053	0.150
<i>Constant</i>	-0.070	0.044	-1.570	0.116	-0.157	0.017

Most notably, rurality of birth county was not statistically significant in determining whether an urban-born surgeon was practicing in a rural area. However, among urban-born surgeons, there were only three possible RUCC classifications (RUCC 1-3) as opposed to the full distribution of 9. When I repeated this regression analysis with each individual RUCC classification regressed separately, only RUCC 2 was statistically significant ($p = 0.009$) in relationship to the reference category of the most urban counties, RUCC 1. This meant that urban surgeons born in slightly smaller metropolitan areas were more likely than urban surgeons born in the very largest metropolitan areas to become urban-rural movers. For context, examples of cities within counties with an RUCC of 2 include Madison, WI; Des Moines, IA; and Wichita, KS.

As in the preliminary analysis, age and sex were statistically significant ($p = 0.000$ and 0.001 , respectively), although again, the effect sizes were quite small. While urban-rural movers tended to be older and more often male than urban-urban stayers, surgeons cannot be recruited on the basis of age or sex – nor should they be, and in addition, with the accelerating retirement rate of rural surgeons, the recruitment of surgeons across all ages and genders is necessary.

Among the training variables, being a DO, completing residency in a less urban area, and completing residency in the Midwest were statistically significant ($p < 0.05$). The proportion of urban-rural movers who were DOs was 16.9 percentage points higher than the average across all urban-born surgeons. Urban-rural movers were also more likely to have completed a less urban residency program, with the proportion of those having done so being 13.7 percentage points higher than the urban-born average. Completing residency in the Midwest was statistically significant ($p = 0.025$) but had a small, negative coefficient. It is again unclear why completing residency in the Midwest could be related to being an urban-urban stayer, rather than an urban-rural mover.

Last, the variable for primarily being responsible for patient care, rather than teaching, research, administration, or other duties, was statistically significant ($p = 0.000$). The proportion of urban-rural movers primarily in patient care was 10.2 percentage points higher than among urban-urban stayers. It was possible that this was tied to the greater prevalence of academically-affiliated surgical practices in urban areas compared to rural. However, when the model was re-run without this variable, there were no significant changes in results.

Extension of the Main Analysis: Rural-rural Stayers. As an extension of the main analysis, I limited the dataset to rural-born surgeons and examined the factors relevant to their being a rural-rural stayer. This separated rural-rural stayers from rural-urban movers in the same

way that the main analysis separates urban-rural movers from urban-urban stayers. What the two groups had in common was a current rural practice location. The same co-variates were applied, and the results are shown in Table 17. There were 545 rural-born surgeons in the sample, and 536 were retained in this model, or 98.3%. While this was a much smaller number than the full sample of nearly 3,500, it was still large enough to serve the purposes of this dissertation's quantitative portion.

Table 17: Extension of the Main Analysis: Results for Rural-Rural Stayers

<i>Source</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>Number of obs</i>	536
				F(9, 526)	4.04
<i>Model</i>	7.840	9	0.871	Prob > F	0.000
<i>Residual</i>	113.308	526	0.215	R-squared	0.065
				Adj R-squared	0.049
<i>Total</i>	121.147	535	0.226	Root MSE	0.464

<i>Outcome: Surgeon is a rural-rural stayer</i>	Coef.	Std. Err.	T	P>t	[95% CI]	
<i>Rurality of birth county</i>	0.043	0.014	3.130	0.002**	0.016	0.071
<i>Age</i>	0.000	0.002	0.250	0.804	-0.003	0.004
<i>Female</i>	-0.030	0.053	-0.570	0.568	-0.135	0.074
<i>MD (0) / DO (1)</i>	0.103	0.107	0.960	0.337	-0.107	0.312
<i>Less urban medical school (1 = yes)</i>	-0.108	0.051	-2.140	0.033*	-0.208	-0.009
<i>Less urban residency (yes = 1)</i>	0.132	0.057	2.310	0.021*	0.020	0.244
<i>Medical school in the Midwest (yes = 1)</i>	0.115	0.055	2.090	0.037*	0.007	0.223
<i>Residency in the Midwest (yes = 1)</i>	-0.188	0.052	-3.650	0.000***	-0.289	-0.087
<i>Primary responsibility is patient care (yes = 1)</i>	0.212	0.079	2.700	0.007**	0.058	0.367
<i>Constant</i>	-0.064	0.151	-0.420	0.671	-0.360	0.232

While rurality of birth location was statistically significant ($p = 0.002$), similar to the main analysis, for rural-rural stayers neither of the other two demographic variables – age or sex – were significant. This was consistent with previous bivariate test results. Among urban-born surgeons, there was a significant difference in age or sex between movers and stayers, but there

was not a significant difference in either of these variables for rural-born surgeons. These demographics may be proxying for behaviors or preferences associated with different generations or different genders, but at face-value they do not hold practical significance for informing rural surgeon recruitment efforts. Being a DO rather than an MD also lost its significance, although it is worth reiterating how few DOs there were in the full sample at the start ($p = 0.337$).

Among the training variables, completing medical school in a less urban environment produced a statistically significant negative beta coefficient, signifying that rural-born surgeons who attended less urban medical schools were actually more likely to be rural-urban movers as opposed to rural-rural stayers ($p = 0.033$). This variable was not significant in previous models. Completing residency in the Midwest was again statistically significant, again with a negative beta coefficient. In this model, though, the negative effect size was larger, -0.188 , as opposed to the effect size of -0.037 in the main analysis of urban-born surgeons. Being primarily in patient care again was statistically significant ($p = 0.007$), with an effect size more than double that in the main analysis. This indicated that the proportion of rural-born surgeons choosing rural practice who were in direct patient care was 21.2 percentage points higher than among rural-urban movers. This is a much larger difference in proportions than found in urban-born surgeons; the proportion of urban-rural movers in patients care was 10.0 percentage points higher than the proportion of urban-urban stayers.

To be consistent with my procedures in the main analysis, in this extension I ran the model again, this time with each individual RUCC classification for birth location regressed separately. The resulting beta coefficients and p-values are shown in Table 18.

Table 18: Extension of the Main Analysis: Excerpted Individual RUCC Classifications

RUCC (in relationship to RUCC = 4, the least rural of rural counties)	Beta coefficient	p-value
5	0.105	0.102
6	0.080	0.161
7	0.129	0.028*
8	0.338	0.021*
9	0.084	0.008**

The more rural the birth county, the more likely it was to have an effect on a rural-born surgeon being a rural-rural stayer instead of a rural-urban mover. The reference category was RUCC 4 since in this analysis the dataset was limited to rural-born surgeons (RUCC 4-9). Neither RUCC 5 nor 6 had a statistically significant effect when compared to RUCC 4. However, this changed at RUCC 7. These more rural counties, RUCC 7-9, were all statistically significant ($p < 0.05$). Surgeons born in these counties were more likely to becoming rural-rural stayers than surgeons born in the least-rural (most urban) of the rural counties. The proportion of surgeons born in an RUCC 8 who were rural-rural stayers was 33.8 percentage points higher than the proportion of rural-rural stayers among those born in an RUCC 4.

Summary. Less than 20.0% of the surgeons in the full sample practiced in rural areas. The vast majority of urban-born surgeons practiced in urban areas (84.3%), and a high proportion of rural-born surgeons also practiced in urban areas (65.3%). On average, though, rural surgeons were born in counties with higher RUCC values (more rural counties) than urban surgeons. In general, rural surgeons tended to be older than their urban counterparts and were more often male. When rural surgeons were subdivided into urban-rural movers and rural-rural stayers, though, there were no such differences by age or sex. Most Midwestern surgeons were also born in the Midwest (68.8%), and this region of birth was highly correlated with completing medical school within the Midwest. Nearly all of these surgeons are MDs rather than DOs

(96.7%), and most completed medical school and residency in urban areas (86.0% and 89.9%, respectively). While nearly three-quarters of the sample completed medical school or residency in the Midwest (72.5% and 73.0%, respectively), this was not statistically significantly different between urban and rural surgeons. Rural surgeons' responsibilities were almost always primarily direct patient care, but urban surgeons were also very often primarily in patient care, 9 out of 10 times. In multi-variate regression analyses, demographics were associated with a surgeon practicing rurally, though at small effect sizes. These variables remained consistent among urban-born surgeons only, with the same directionality and similarly-small effect sizes, in determining whether the urban-born surgeon was now a rurally-practicing surgeon. Completing one's medical degree in a less rural area was not a factor in the preliminary analysis, nor in the main analysis, but it was significant in the extension of the main analysis, examining whether rural-born surgeons now practiced in rural areas. Completing residency in the Midwest consistently had a small, negative, statistically significant effect across all models. Being primarily responsible for patient care consistently had a positive, significant effect across all models. The low adjusted R-squared values for all models ($< 7.0\%$) suggested that the models had low explanatory power and that much of the variation in surgeons' practice location choices should be attributed to other factors not in these analyses.

Discussion

The basic findings concerning urban and rural locations, age, and sex coincided with much of the existing literature of rural health workforce shortages. Only about 20.0% of the U.S. population resides in rural areas (Avery & Wallace, 2015), therefore it was no surprise that only 16.0% of the surgeons in this sample were born in a rural area. However, it was important that while 16.0% of surgeons were born in rural counties, 10.4% of surgeons were rural-urban

movers, suggesting two-thirds of these rural-born surgeons were leaving for more populous areas. At the same time, 81.2% of surgeons were born in urban counties, but 12.8% of all surgeons were urban-rural movers, suggesting that only one-seventh of urban-born surgeons left for less populous areas. While these proportions were imbalanced, the numbers behind the percentages were more important. Rural-born surgeons who left totaled 356, while urban-born surgeons who arrived totaled 436, a net gain of 80 surgeons.

This small difference suggests there is real opportunity to recruit urban-born surgeons to rural practices. The distribution of movers and stayers illustrated this opportunity even more clearly. Only 5.5% of surgeons were born in rural areas and now practiced rurally, whereas 10.4% were born rurally and now practiced in an urban environment. Last, 12.8% of all Midwestern general surgeons were born in an urban county and now practice rurally. This showed the importance of not only retaining rural-born surgeons in rural areas but also recruiting urban-born surgeons to rural areas. There are more people born in urban areas, and therefore even a small increase in the percentage of surgeons who are urban-rural movers could yield a meaningful increase in number of surgeons for rural communities.

More men than women practiced in rural areas, but women were becoming an increasing share of the surgical profession according to these data. Among rural-born surgeons, the proportion of urban-rural movers who were women was not statistically significantly different from the proportion of rural-rural stayers who were women. Conversely, among urban-born surgeons, there were more women among the urban-urban stayers than among the urban-rural movers. This discrepancy between the tendencies of urban-born versus rural-born women surgeons raised questions about how women made education and training choices throughout the workforce pipeline and about potential systemic barriers to women being exposed to rural

training at the same rates as men. Educational experiences and the practice location decisions of women surgeons were further explored through the qualitative methods. Education opportunities ought to be offered equally to all genders, and recruitment efforts cannot – and should not – be discriminatory toward any gender.

Rural surgeons were aging, yet more of the younger surgeons tended to practice in urban areas according to these data. Similar to the sex variable, data on surgeons' ages and the age distribution by geography raised questions about current approaches to medical education and surgical training. In the qualitative analysis, I explored how some of the younger surgeons' experiences compared to those of older surgeons, though these generational differences were not the primary focus of this dissertation. This trend among younger surgeons to choose urban practice compounds with the aforementioned gender discrepancies to exacerbate the existing rural surgeon shortage. Rural communities seeking to improve access to surgical services must find recruitment and retention strategies that speak to younger general surgeons, both men and women.

While DO surgeons represented a small share of the overall sample currently, in rural environments where every additional surgeon makes a significant difference in providing access to surgical services, no sub-set of prospective recruits should be too small to consider. Among DOs who had chosen general surgery, it appeared they were more inclined to practice rurally than their MD colleagues.

For urban-rural movers, having graduated from a less urban medical school ($\text{RUCC} \leq 2$) had no statistically significant effect on their being urban-rural movers as opposed to urban-urban stayers. This indicated that among urban-born surgeons, the rurality of their medical education may not have played a significant part in their ultimate practice location choice. For

rural-rural stayers, however, a less urban medical school was statistically significant ($p = 0.033$), and it had a negative effect. This meant that for some rural-born surgeons, attending a less urban medical school actually played a part in pushing them toward urban practice, rather than rural. Rurality of one's medical school did separate rural-rural stayers from rural-urban movers. It is possible that some rural-born students discovered after completing medical school in a less urban environment that they wanted to experience more of an urban environment for any number of reasons, possibly related to lifestyle, surgical practice, or both. Interestingly, less-urban medical school graduates in this sample did go on to less-urban residencies at a higher rate (27.7%) than did the most-urban medical school graduates (7.7%). However, only 106 surgeons in the entire sample (3.1%) completed both medical school and residency in less-urban environments. Of those 106, less than one-third were in rural practice (28.3%, $n = 30$). It was also notable that all these sub-sets of surgeons – less-urban medical school graduates, those who completed less-urban residencies, and those who did both – were evenly distributed by age. There were nearly-equal proportions of surgeons in these sub-sets who were in their 30s, 40s, 50s, and 60s. Surgeons in their 60s would have completed their surgical training approximately 30 years ago. Therefore, for at least 30 years, the trends in selection of less-urban medical schools and less-urban residencies have remained stable. These same proportions by age did not hold true for the 30 surgeons who graduated from a less-urban medical school, completed a less-urban residency, and are also now practicing rurally. 19 of these surgeons were in their 50s or older, whereas only 6 were in their 30s, and 5 were in their 40s. Considering the data available included 3,414 surgeons, these are strikingly low numbers.

Attending medical school in the Midwest did not separate urban-rural movers from urban-urban stayers; however, it did separate rural-rural stayers from rural-urban movers. In the

robustness check, the mean percentage of rural-rural stayers who graduated from a medical school in the Midwest was 11.5 percentage points higher than the rural-born average ($p = 0.037$). Completing residency in the Midwest, on the other hand, had a negative, statistically significant effect in both models. The mean percentage of urban-rural movers who completed a Midwestern residency was 3.7 percentage points lower than the rural-born average ($p = 0.025$). Similarly – but with a notably larger effect – the rural-rural stayer average rate of completion of a Midwestern residency program was 18.8 percentage points less than the rural-born average. Surgeons in both of these outcome groups – urban-rural movers and rural-rural stayers – had chosen rural practice in the Midwest, yet both of them were less likely to have completed their residency in the Midwest. It was unclear whether this spoke to the number of surgical residency programs in the Midwest and their capacities; perhaps medical students who went into surgery had to seek out programs in other regions, even if they were interested in coming back to practice in a rural area of their home region. The explanation of this variable’s effect on movers versus stayers could be as simple as the number of residency positions available in the region; or, surgical trainees may have had a desire to experience a different part of the country before settling in the Midwest. These questions about moving or staying at different points in one’s life were elucidated by the qualitative data. In the quantitative analysis, however, the training variables raised more questions about medical education than they did about the surgeons themselves.

It bears repeating that more than 90.0% of the surgeons in the sample listed patient care as their primary responsibility, as opposed to teaching, research, administration, or other efforts. The little variation that remained in this variable, however, was significant in separating urban-rural movers from urban-urban stayers and in the extension of the main analysis in separating

rural-rural stayers from rural-urban movers. This meant that regardless of birth location, having a rural practice location was positively associated with primarily being engaged in patient care. This supported the idea that urban practices may have been more likely to include teaching, research, administrative, or other responsibilities. The findings in the main analysis and the extension of the main analysis were consistent with the preliminary analysis. It has been well-documented that surgical trainees appreciate hands-on learning (Halverson et al., 2013; Jarman et al., 2009), and in rural practice, rural surgeons are more likely to play a role more akin to primary care physicians in terms of patient engagement (Pathman & Ricketts, 2009). It was possible that the combination of these two affinities helped draw surgeons to rural areas, and perhaps that was what we were seeing through this patient care variable.

Limitations of the Data and Analyses

One of the chief limitations of the AMA MasterFile data was in the variable for birth location. While we knew where surgeons were born, this did not necessarily correspond to where they were raised, nor the place they might have identified as their hometown. Similarly, the address for current location was self-reported as ‘preferred mailing address,’ which for about half the surgeons was their professional address and for the other half was their home address. This dissertation created definitions for movers and stayers based on birth location, corresponding to reported birth city and state, and current practice location, corresponding to preferred mailing address. It was possible that the distribution of types of movers and stayers could change if there were a variable for self-reported hometown instead of birth location and if AMA members were asked specifically for their primary practice location as opposed to preferred mailing address. The other limitation in this variable was related to time and the assignment of rurality. RUCCs from the year 2013 were used to assign rurality to both birth locations and current practice

locations. Some of the surgeons in the sample, however, were born more than 80 years ago, calling into question whether the urban or rural classification of their birth location had changed over that time. It has been well established that metropolitan areas in the US have grown in population. If rurality were assigned based on the RUCC for each birth year, that could have created a more accurate depiction of movers and stayers.

Chapter 4: Rural Communities That Are Different

Univariate and Bivariate Analyses

To answer Research Question 1b, the surgeon-level data from the AMA MasterFile was used to construct an indicator variable for urban-rural mover. As established in the background, most of the nation's population resides in urban areas, so they have the largest pools of surgeons who, in theory, could be recruited to rural areas. Once constructed, the urban-rural mover indicator was merged into the Health Resources and Services Administration's Area Health Resource File (AHRF) using county-state Federal Information Processing Standards (FIPS) codes, allowing for an investigation into community characteristics associated with the urban-rural mover indicator. The AHRF data were also merged with U.S. Census Bureau County Business Patterns (CBP) data and arrest data from the Uniform Crime Reporting Program (UCRP) Data Series. This allowed for variables to be included not only on county health resources and demographics but also amenities and safety. After all merging was completed, the dataset was narrowed to rural counties only, those with an RUCC of 4 or greater, yielding 752 counties. According to the RUCC classification system, counties with a 4-9 are deemed non-metropolitan, and they are assigned their classification based on both population and adjacency to more populous areas. Of the 752 counties retained in the dataset, 226 (30.1%) had at least one general surgeon who was an urban-rural mover. The objective of 1b was to determine whether these 226 counties were different from the remaining 526 (70.0%) counties, that had either no surgeon or only rural-rural stayers, in measurable ways that may inform rural communities in their efforts to recruit and retain general surgeons.

Table 19 shows how many counties in this sample were in each RUCC category. Most were classified as 6, 7, or 9. The middle column is the distribution of the 226 counties with at

least one urban-rural mover, whereas the far-right column is the distribution of the 526 counties with no urban-rural movers. Most counties with at least one urban-rural mover were a 4, 6, or 7, whereas those without these movers were most often a 9. This was logical considering an RUCC of 9 indicated the smallest and most isolated counties on the urban-rural continuum; these were also the least likely to have a hospital (40.0% did not).

Table 19: Rural Counties with Urban-Rural Movers

RUCC	Distribution of Counties in Sample	Distribution of Counties with at Least 1 Urban-Rural Mover	Distribution of Counties with 0 Urban-Rural Movers
4	9.6%	29.2%	1.14%
5	4.5%	10.2%	2.1%
6	27.0%	30.1%	25.7%
7	21.0%	25.7%	19.0%
8	10.0%	0.9%	13.9%
9	27.9%	4.0%	38.2%
	100.0%	100.0%	100.0%

The variables in Table 20, column 1 below had been selected for inclusion in the 1b analyses during the dissertation proposal phase. Column 2 reflects the variables included in the final dataset, and an explanation of these choices follows.

Table 20: Variables Included in Community-Level Analyses

Independent variables selected during the dissertation proposal phase	Independent variables addressed in the dissertation
Community demographics RUCC Percent white (race) Percent eligible for Medicare (age) Percent with a four-year degree (education)	Community demographics Population (scaled; divided by 10,000) Percent eligible for Medicare Percent below poverty Percent with a four-year degree
Health infrastructure Number of hospitals Number of hospital beds per 100,000 Primary care physicians per 100,000 Number of nurse FTEs Presence of a medical/surgical ICU Number of operating rooms	Health infrastructure Presence of at least one hospital Number of hospital beds Number of primary care physicians Presence of a medical/surgical ICU
Community amenities Median home value Funding of public schools Presence/density of public parks Presence/density of apparel stores Presence/density of restaurants and bars Crime rate	Community amenities # of K-12 schools* # of grocery stores* # of violent crimes*

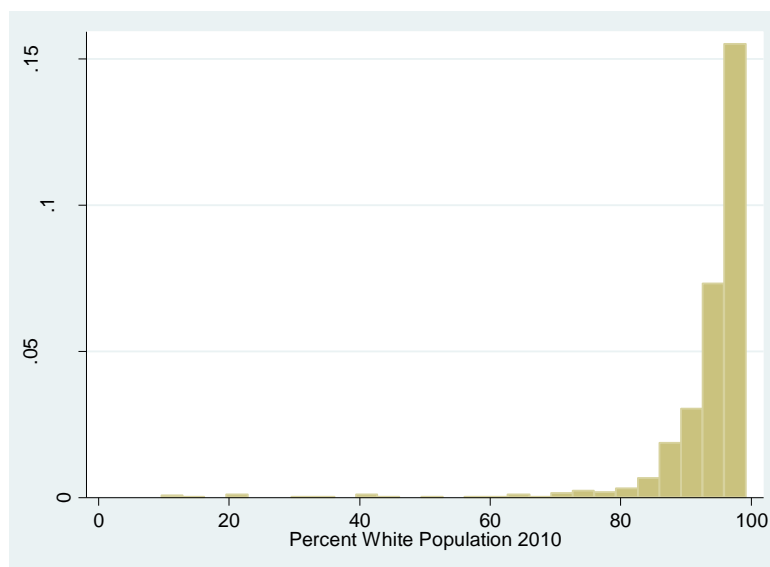
**Variables indicate a county is at/under (0) or over (1) the 50th percentile for number of establishments, in the cases of retail variables, or arrests, for the violent crimes variable.*

Demographics. RUCC was correlated with the outcome variable in a negative direction at 53.7%. Just over half the variation in whether a county had an urban-rural mover could be attributed to the county's RUCC classification. However, because RUCC was comprised of population as well as adjacency to larger areas, RUCC was correlated with population in the negative direction at 78.0%; as RUCC went up (from most urban at 1 to most rural at 9), county population decreased. Population was positively correlated with a county having an urban-rural mover at 61.7%. In spite of these high correlations, some measure of rurality needed to remain in the multi-variate regression analyses as a control. Because RUCC had two components, which could confuse the interpretation of results, population was used. It was scaled down, with the true population divided by 10,000, in order to more easily interpret regression results. By controlling

for population, I was able to say with more certainty what other county characteristics mattered in attracting an urban-rural mover.

Racial composition in these Midwestern rural counties was very homogenous. The mean percentage of county population that was white is 93.0%, and the median was 96.0%. Counties at and below the first percentile had populations that were 33.7% white or less, but counties at the fifth percentile and greater had populations that were 80.7% white or more. The standard deviation was 10.2 percentage points. All of the counties at or below the first percentile were majority-Native American counties located in North Dakota, South Dakota, and Wisconsin. Some were even entirely located within Native American reservations. I chose to exclude race from this analysis since this dissertation was concerned with the supply of non-Indian Health Service surgeons.

Figure 7: Distribution of Percentages of Counties' Populations That Are White



The mean percentage of the population eligible for Medicare was 22.5%, indicating that nearly one-quarter of these counties' populations was over 65 years of age. This was relevant to the presence of surgeons and delivery of surgical services because older individuals tend to be

sicker and need more healthcare services, as is common knowledge. Using a Student t-test, it was determined that rural counties with an urban-rural mover had a statistically significant, lower mean percentage of the population eligible for Medicare (21.5%) than rural counties without an urban-rural mover (22.9%), at a level of $p = 0.000$. Although it has been well-proven that rural areas tend to have older populations and, therefore, larger proportions of their populations eligible for Medicare, this variable was only correlated with the outcome variable at -14.2% and correlated with population at -23.6%. Therefore, the main, multi-variate analysis included percentage eligible for Medicare while controlling for population.

Poverty was also examined because of its relationship to accessing surgical services, as out-of-pocket costs tend to be costlier for surgery than less resource-intensive care, such as primary care and preventive medicine. The mean percentage of the population in poverty was 13.8%, indicating that the vast majority of people in these counties were living above the poverty line. Using a Student t-test, it was determined that the mean poverty rate in counties with an urban-rural mover (13.80%) was not significantly different than that in counties without an urban-rural mover (13.82%), with a p-value of 0.954. This was consistent with poverty's low correlation with the outcome variable at 3.9%. The only co-variate with a notably higher correlation with poverty was the percentage of adults with a four-year college degree, at -21.6%. The more highly-educated a population was, the smaller its proportion of people in poverty was.

The mean college education rate among adults in this dataset was 18.3%, indicating that fewer than one-fifth of people in these rural counties held a four-year college degree or higher. Education could be related to the presence of surgeons since surgeons themselves are highly educated and could seek out places to live where there are similarly-educated peers. In fact, the data suggested this could be true; the results of a Student t-test indicated that counties with

urban-rural movers had a statistically significant higher rate of college education (19.3%) than did counties without urban-rural movers (17.8%), at a level of $p = 0.000$. The correlation between having an urban-rural mover and a higher rate of college education was low, however, at 11.1%.

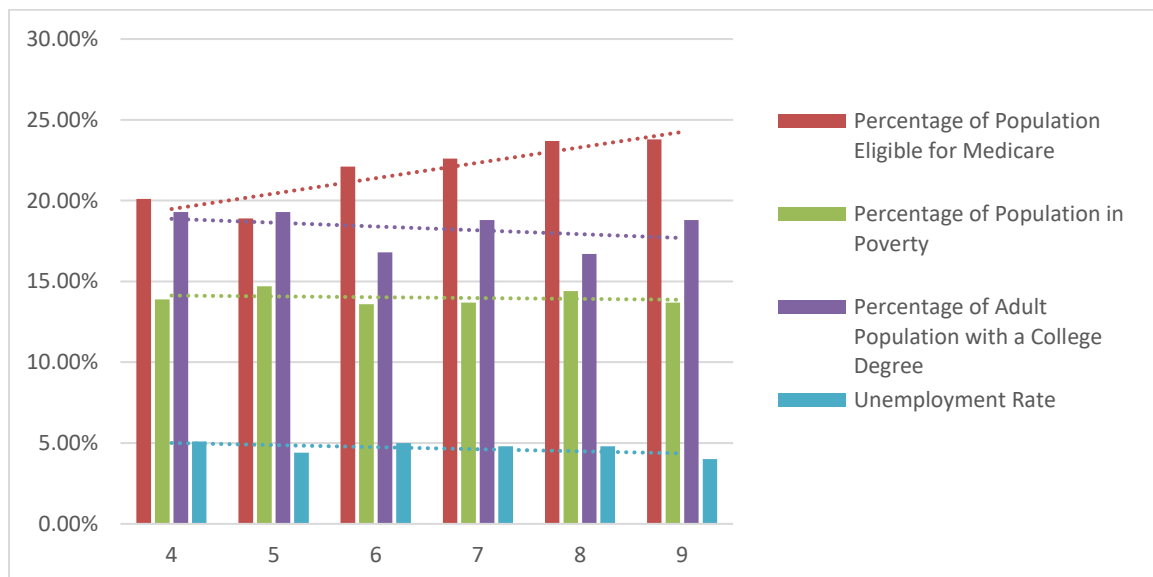
The mean unemployment rate was 4.6%, which was slightly higher than the national average of 4.0% ("Labor Force Statistics from the Current Population," 2019). Interestingly, unemployment in counties with urban-rural movers was statistically significantly higher (4.9%) than in counties without urban-rural movers (4.5%) at a level of $p = 0.006$. However, unemployment was correlated with the poverty rate at 52.6%. For the sake of simplifying the model, the poverty rate was retained as a measure of socioeconomic well-being, and the unemployment rate was removed.

Table 21 summarizes the means of the demographic variables – percentage of population eligible for Medicare, poverty rate, percentage of adults with a college degree, and unemployment rate – by RUCC classification. As one would expect, the most rural counties (RUCC=9) had older populations and a lower proportion of adults with a college degree. The directionality was reversed, though, for poverty and unemployment, with the most rural areas having a slightly smaller proportion of their populations living below the poverty line and having an unemployment rate on-par with the national average.

Table 21: Demographic Variables

RUCC	Percentage of Population Eligible for Medicare	Percentage of Population in Poverty	Percentage of Adult Population with a College Degree	Unemployment Rate
4	20.1%	13.9%	19.3%	5.1%
5	18.9%	14.7%	19.3%	4.4%
6	22.1%	13.6%	16.8%	5.0%
7	22.6%	13.7%	18.8%	4.8%
8	23.7%	14.4%	16.7%	4.8%
9	23.8%	13.7%	18.8%	4.0%
Average	22.5%	13.8%	18.3%	4.6%

Figure 8: Demographic Variables by RUCC



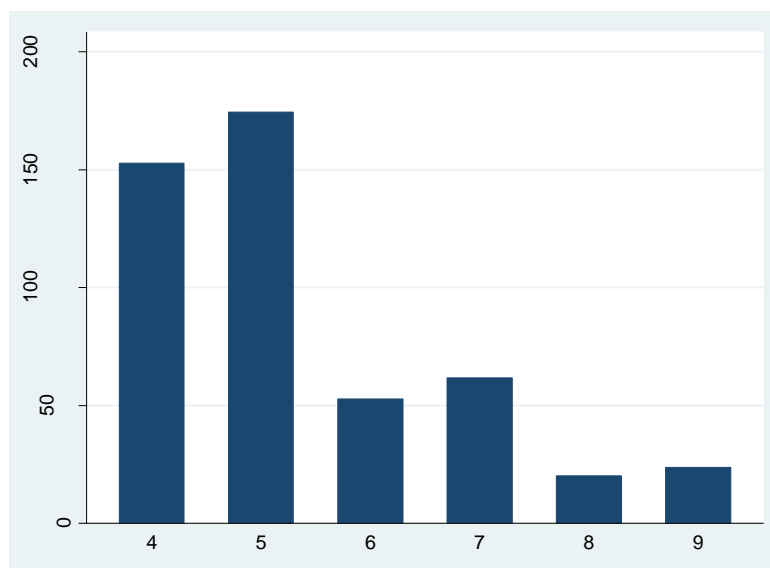
Health Resources. Given that surgery is a resource-intensive specialty, it was logical to examine the relationship between supplies of various health resources and the presence of urban-rural movers in rural counties. In theory, more health resources – in particular, greater surgical infrastructure – would make a county a more attractive potential practice location for a general surgeon because of its implications for greater scope of practice and complexity of cases.

First, a surgeon needs a facility in which to operate. Counties in this dataset had between 0 and 4 hospitals each, with the 50th percentile being 1. It was therefore logical to include

presence of at least one hospital as the hospital measure in the model. Among these 752 counties, 597 (79.4%) had at least one hospital. Using a Student t-test, it was determined that there was a statistically significant difference between the mean percentage of counties with at least one hospital among counties with an urban-rural mover (98.2%) and those without an urban-rural mover (71.3%) at a level of $p = 0.000$.

As a basic measure of hospital capability, I used number of hospital beds as a continuous variable. Conventional wisdom suggests hospitals at or below 25 beds are often Critical Access Hospitals (CAHs), and the greater the number of beds, usually the more likely a hospital is to have tertiary or even quaternary care capabilities. Hospital beds per county ranged from 0 to 655 with a mean of 58.3 and median of 25. The median of 25 was consistent with the prevalence of CAHs in rural counties. The standard deviation was 78.4, reflecting a great disparity between the numerous counties with few beds and the few counties with numerous beds. Figure 9 shows the mean number of hospital beds among counties in each RUCC classification.

Figure 9: Mean Number of Hospital Beds per County by RUCC



A Student t-test showed that counties with urban-rural movers averaged 111.8 hospital beds, whereas those without averaged 35.3, a difference in means that was significant at $p = 0.000$. Even though number of hospital beds was correlated with the outcome variable at 41.7% and correlated with population at 56.9%, it was retained in the model because of its conceptual importance. The theory remained that more hospital resources – in this case, greater inpatient capacity – made a rural community an attractive practice location for urban-born surgeons.

Surgeons rely primarily on other physicians – usually those in primary care specialties – for patient referrals. Therefore, theoretically the supply of primary care physicians in a county would be related to the supply of general surgeons and perhaps to the presence of an urban-rural mover. On average, the counties in this dataset had 11 primary care physicians, but the range was 0 to 127, with a median of 6. A Student t-test showed that counties with urban-rural movers had, at a statistically significant level of $p = 0.000$, more primary care physician (23.8) than counties without an urban-rural mover (5.5).

The most relevant variable to level of care, beyond hospital beds, was ICU beds. I utilized an indicator variable, with 0 for no beds and 1 for at least 1 ICU bed. Of the 752 counties in the dataset, 242 (32.2%) had at least 1 ICU bed. This average, though, was skewed by the very low prevalence of ICUs in counties with an RUCC of 8 or 9. Nonetheless, the presence of this resource was statistically significantly different in counties with and without urban-rural movers. In counties with an urban-rural mover, there was an ICU 65.9% of the time, whereas in counties without, only 17.7% of the time, at a level of $p = 0.000$.

Last, it seemed fundamental that a surgeon must have an operating room in order to do his or her job. However, only 63.4% of these counties reported having at least one operating room. Counties with an urban-rural mover had an OR 85.8% of the time, whereas those without

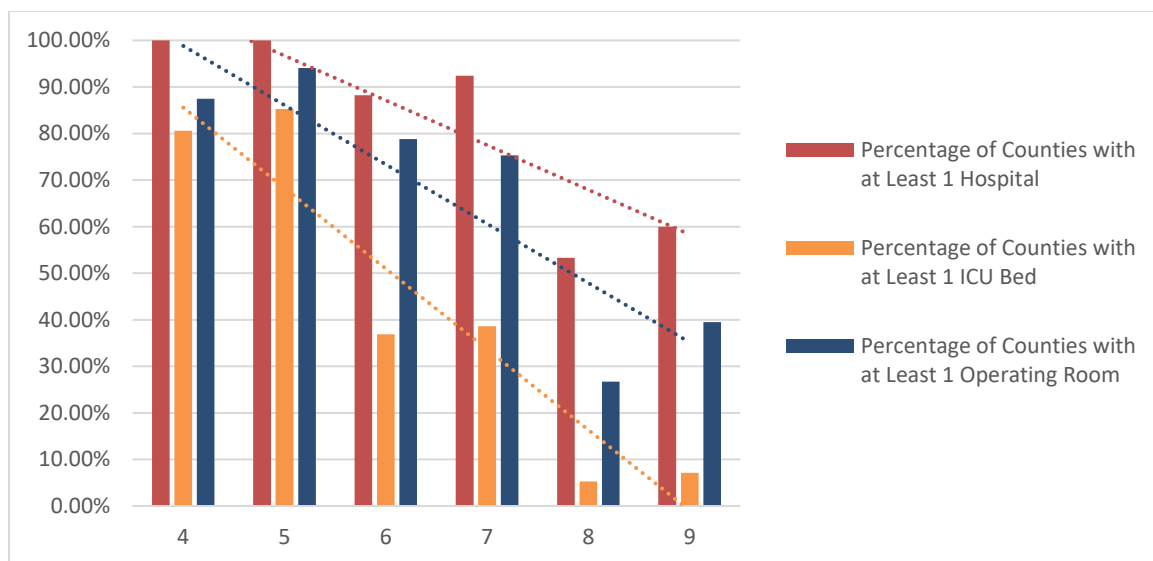
had one 53.8% of the time, at a level of $p = 0.000$. However, having an OR was correlated with having an ICU at 67.8%. Conceptually, if a surgeon was considering the health resources of a community during a practice location decision, he or she would likely assess pre- and post-operative capabilities as well as operative. If post-operative care were not available, such as ICU, then there would be cases surgeons would not perform in the first place, rendering the OR moot. Between the two variables, ICU seemed like it could matter more; therefore, the OR variable was not be included in the final model.

Table 22 summarizes the means of the health resources variables – presence of a hospital, hospital beds, primary care physicians, ICUs, and ORs – by RUCC classification. Reading the table from the top down, from least to most rural, the direction of the data was consistent with baseline assumptions. All of the least rural counties – those in RUCCs 4 and 5 – had at least one hospital. As counties became more rural, they more infrequently had a hospital; only 60.0% of the most rural counties did. The same held true for hospital beds, primary care physicians, ICU beds, and ORs. For hospital beds and primary care physicians, there was a precipitous drop from RUCC 5 to RUCC 6. According to the classifications, RUCC 5 counties could have populations of between 20,000 and 249,999, but they were not adjacent to more populous areas. RUCC 6 counties, on the other hand, could have populations as low as 2,500, but they were adjacent to more populous counties ("Rural-urban continuum code, 2013," 2013).

Table 22: Health Resources Variables

RUCC	Percentage of Counties with at Least 1 Hospital	Hospital Beds	Primary Care Physicians	Percentage of Counties with at Least 1 ICU Bed	Percentage of Counties with at Least 1 Operating Room
4	100.0%	152.7	33.1	80.6%	87.5%
5	100.0%	174.4	33.3	85.3%	94.1%
6	88.2%	52.8	11.8	36.9%	78.8%
7	92.4%	61.6	10.8	38.6%	75.3%
8	53.3%	20.1	2.2	5.3%	26.7%
9	60.0%	23.6	2.4	7.1%	39.5%
Average	79.4%	58.3	11.0	32.2%	63.4%

Figure 10: Percentage of Counties with Health Resources by RUCC



Amenities. Median home value was analyzed because surgeons are high-income earners, and it was logical to think they might seek high-quality housing. Given that the dataset was limited to rural counties in the Midwest, there was little reason to believe there would be wild variations in housing values, so the variable was left in its original form as continuous dollar amounts; here, amounts have been rounded to the nearest dollar. The mean across all counties in the dataset was \$100,665, with a range of \$43,700 to \$242,400 and a median of \$95,600.

Notably, these were home values, not market prices. Home values were found to be statistically significantly higher on average in counties with urban-rural movers (\$115,644) than in counties without (\$94,229) at a level of $p = 0.000$. This variable was found to be correlated with populations' levels of college education. I viewed both these variables as representative of class status and determined only one was needed in the final model. Given the wide variation in home values, I chose to retain college education in the final model.

Data on school funding could not be included because school district boundaries did not align with county boundaries. It was not possible to merge this data with the AHRF since that file relied on county identifiers. However, the County Business Pattern data did include numbers of K-12 schools, or 'establishments,' per county. A variable was created denoting whether a county was at/under or over the 50th percentile for number of K-12 institutions, and this was used instead of funding data. Unfortunately, 341 (45.3%) counties were missing data for this variable. Most of the counties missing a large proportion of data were in the RUCC categories of 6 and larger, meaning the more rural, isolated counties. There were 115 (15.3%) counties above the 50th percentile in number of K-12 institutions. A Student t-test showed that among counties with urban-rural movers, on average 43.8% of them were above the 50th percentile in number of K-12 schools as opposed to 15.9% of counties without an urban-rural mover, and this was a statistically significant difference in means at $p = 0.000$. Being above the 50th percentile in number of K-12 schools was correlated with population at 44.7%. While nearly half the variation in K-12 schools could be explained by population size, over half could not. Due to its theoretical importance to practice location choice, it was retained in the main multi-variate analysis.

Also using the County Business Pattern data, I was able to include the number of establishments classifying themselves as grocery stores, general merchandise stores, and

accommodation and food service businesses. Grocery stores provide basic necessities, and it was logical to include them since traveling to another town for basic supplies could be a deterrent to surgeons choosing rural towns. Fortunately, the CBP data on grocery stores was well-reported, with only 22 counties out of 752 (2.9%) missing data. Across all counties, 331 (44.0%) were above the 50th percentile for number of grocery stores. According to a Student t-test, counties with urban-rural movers were above this mark 78.1% of the time, and counties without were above only 30.8% of the time; this was statistically significant at the $p = 0.000$ level.

Data on food and accommodations establishments were similarly well-reported, with only 3 counties (0.4%) missing data. The accommodation and food services category included “establishments providing customers with lodging and/or preparing meals, snacks, and beverages for immediate consumption” (*North American Industry Classification System*, 2017). These types of businesses could indicate the presence of tourism, potentially serving as a proxy for less isolation. This idea was supported by the fact that being above the 50th percentile in number accommodations and food services establishments was correlated with rurality at -64.9%; as rurality increased, the number of those establishments decreased. Across all counties, 371 (49.3%) were above the 50th percentile for number of food and accommodations establishments. Again, similarly to grocery stores, the difference in means using a Student t-test was statistically significant at the $p = 0.000$ level. Counties with urban-rural movers were above the 50th percentile 91.2% of the time, whereas those without were above only 31.5% of the time. This variable was correlated with being above the 50th percentile in number of grocery stores at 49.5% and therefore was not included in the final model.

General merchandise stores included department stores, discount department stores, and warehouse clubs and supercenters. This category of retailers was chosen instead of categories for

clothing or apparel because it was a broader and more widely-reported category among rural counties. Data on general merchandising stores was less well-reported than those for grocery and food and accommodations establishments, but a smaller proportion was missing than for educational institutions. There were 87 (11.6%) counties without data for general merchandising stores. Across all counties, 39.2% were above the 50th percentile for number of general merchandising stores. As with previous amenities, the difference in means between counties with and without urban-rural movers was statistically significant at the $p = 0.000$ level. Counties with an urban-rural mover were above the 50th percentile 76.9% of the time, whereas those without were above only 27.7% of the time. However, being above the 50th percentile in number of general merchandising stores was positively correlated with grocery stores at 46.2%, so this variable was not included in the final model.

Unfortunately, appropriate data on the use of county land area for parks or greenspace could not be found and therefore were not included in the dataset.

There were several available datasets on crime at the county level through the National Archive of Criminal Justice Data (NACJD) at the Inter-University Consortium for Political and Social Research at the University of Michigan. The primary choice I had to make was whether to examine number of arrests or crime rates. I chose number of arrests at the county level determining that in more rural areas crime might be understood by surgeons on an individual person level rather than in the form of crime rates. Once I had chosen number of arrests, I then had to choose the applicable population: all persons, adults, or juveniles. I chose the Uniform Crime Reporting Program Data Series for all arrests, all persons, for the year 2010. Many of my other co-variates were from the years 2010 to 2015, making arrests from 2010 relevant to the rest of the dataset. To make the crime variable consistent with other amenities variables, I

constructed an indicator variable for whether a county is at/under or over the 50th percentile. The counties were nearly evenly split, with 363 (48.3%) being above the 50th percentile and 389 (51.7%) being below. Counties with urban-rural movers were above the 50th percentile 73.9% of the time, whereas those without were above only 37.3% of the time. This suggested that urban-rural movers were located in counties that had a higher number of arrests for violent crimes.

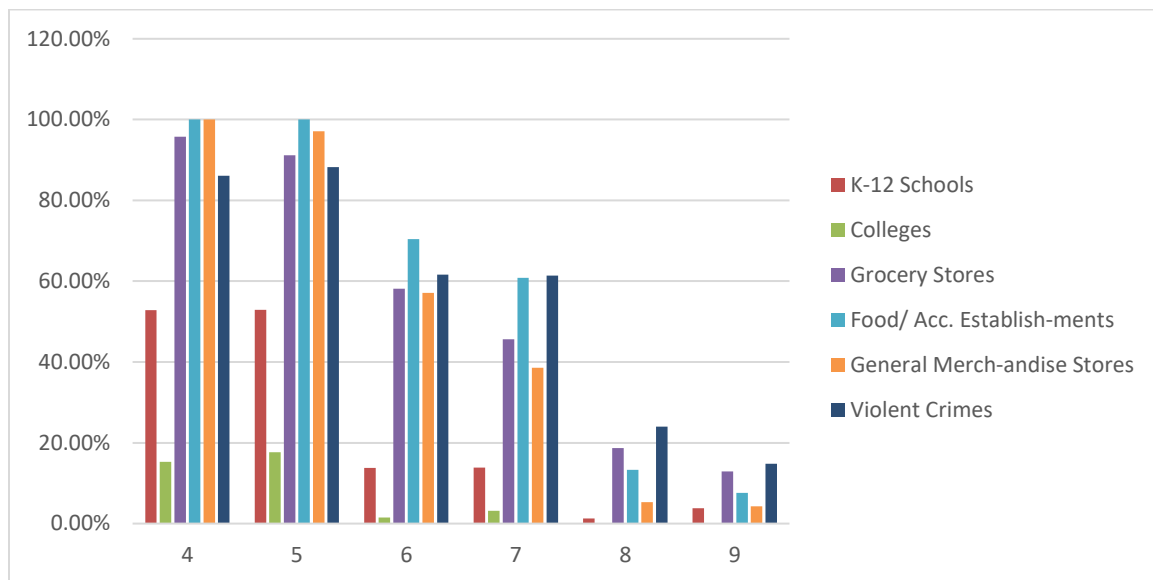
Table 23 summarizes the means of the amenities by RUCC classification, and Figure 11 presents these visually. All of the variables in this category followed the same pattern: as rurality increased, amenities decreased. As was seen among the health resources variables, there was a fairly precipitous drop in amenities between RUCC 5 and RUCC 6 counties.

Table 23: Amenities Variables

RUCC	Average Home Value	K-12 Schools*	Grocery Stores*	Food/ Acc. Establish-ments*	General Merchandise Stores*	Violent Crimes*
4	\$118,465	52.8%	95.8%	100.0%	100.0%	86.1%
5	\$114,832	52.9%	91.2%	100.0%	97.1%	88.2%
6	\$107,104	13.8%	58.1%	70.4%	57.1%	61.6%
7	\$101,766	13.9%	45.6%	60.8%	38.6%	61.4%
8	\$94,714	1.3%	18.7%	13.3%	5.3%	24.0%
9	\$87,341	3.8%	12.9%	7.6%	4.3%	14.8%
Average	\$100,665	15.3%	44.0%	49.3%	39.2%	48.3%

**Variables are 0/1 indicators for whether a county at/under or over the 50th percentile for supply of each type of establishment. Percentages in this table reflect the percentage of counties in each classification that are above the 50th percentiles.*

Figure 11: Percentage of Counties with Select Amenities by RUCC



The results of bivariate testing were likewise clear: as amenities decreased, urban-rural movers were present less frequently. We cannot assign causation from these tests, but the results provide valuable guidance in the next stage, multi-variate regression analysis.

Multi-Variate Analyses

A multi-variate regression analysis was conducted with the outcome being the presence of at least one urban-rural mover in a rural county. As stated, the dataset was narrowed to only rural counties, and the co-variables fell into three categories: demographics, health resources, and amenities. The goal was to explore which of these categories could be most relevant in attracting not just any surgeons, but urban-born surgeons to rural areas and, within each category, which characteristics may be most relevant.

The three categories of variables were examined individually. Within the demographics category, the variables chosen for the multi-variate model after bivariate analyses were: population (scaled) and percentages of the population eligible for Medicare, living under the poverty level, and with a college degree. Each variable was added to the model in that sequence,

as it was the order of theoretical importance from likely most important to likely least important. First, population was regressed against the presence of an urban-rural mover, and it returned a beta coefficient of 0.145 which was statistically significant at $p = 0.000$. This suggested that, on average, rural counties with an urban-rural mover had 1,450 more people than did counties without one. Practically speaking, this difference was nearly inconsequential. Next, the percentage of the population eligible for Medicare was added and, while controlling for population, was found to be statistically insignificant at $p = 0.821$. Next, poverty was added; it was not statistically significant at $p = 0.467$. Last, the percentage of the population with a college degree was added. It was statistically significant at the $p = 0.000$ level, but it had a small effect size with a beta value of 0.011. This suggested that the proportion of college graduates in a county with an urban-rural mover was 1.1 percentage points higher than in the average rural county. Similarly to the result for population, from a practical standpoint this difference was inconsequential. The statistical insignificance of Medicare eligibility and poverty did not change after adding college graduates. The small effect sizes for population and college education suggested that they were not, in fact, major reasons why an urban-born surgeon might choose a rural surgical practice.

Variables in the category of health resources were regressed against having an urban-rural mover next. The variables chosen after bivariate analyses were the presence of a hospital, number of hospital beds, number of primary care physicians, and presence of an ICU. As in the previous category, each variable was added in sequence. First, the presence of a hospital was regressed against presence of an urban-rural mover. It was statistically significant at the $p = 0.000$ level with a coefficient of 0.364. Next, hospital beds were added, and while their coefficient of 0.002 was statistically significant at the $p = 0.000$ level, the small effect size

suggested a negligible effect in reality. Similarly, when primary care physicians were added, they were also significant at $p = 0.000$, but the difference between a county without an urban-rural mover and with was only 0.002 primary care physicians on average, not even a whole person. The addition of this variable, though, did cause hospital beds to move from statistical significance to insignificance. Last, ICU beds were added, and they were significant at $p = 0.000$, but again the effect size was relatively small, 0.183. With this addition, hospital presence and primary care physicians remained significant, and hospital beds continued to be insignificant. It was notable that when ICUs were added, the effect size of presence of hospital fell to 0.087. In comparison, then, the ICU effect size of 0.183 was much larger. It was logical that the presence of a hospital would have an effect since, as stated, surgeons need a place to operate and for patients to be cared for post-operatively. Similarly, the significance of an ICU was also logical, as ICU capabilities allow for a broader scope of surgical practice, potentially making a place more attractive to a surgeon. These results suggested that while inpatient capacity and patient referrals are important, the presence of a hospital and the intensity of its resources were far more important in attracting an urban-born surgeon.

In the category of amenities, the same process was followed, adding each co-variate one at a time in sequential regression models. The variables initially included in the model after bivariate testing were: K-12 schools, grocery stores, and violent crime. First, being at/under or over the 50th percentile for number of K-12 schools was added. It was significant at $p = 0.000$ with a beta value of 0.340. However, due to missing data in this variable, its use caused the number of observations in the model to fall to 411 counties, only 56.7% of all counties in the dataset. For this reason, the K-12 variable was dropped from further analysis at this point. Next, being at the 50th percentile for number of grocery stores was regressed against having an urban-

rural mover. It was statistically significant at $p = 0.000$ with a beta value of 0.406. Then, being over the 50th percentile for violent crimes was added. This, too, was significant at $p = 0.000$, with a beta value of 0.181. With this addition, the beta value for grocery stores fell to 0.339, but the variable retained its statistical significance. The relationship between crime and a county having an urban-rural mover was most likely due to correlation between the outcome variable and population. To test this, population (scaled) was added to this grouping of co-variates. As expected, it was statistically significant at $p = 0.000$, and it caused crimes to no longer be significant. The beta value for grocery stores fell further, to 0.077, and the p-value increased slightly to $p = 0.026$.

The following variables were statistically significant in the final model using an alpha level of 0.05: population, presence of a hospital, number of primary care physicians, and presence of an ICU. Consistent with previous regressions, none of the demographic variables were significant. This model indicated that counties with an urban-rural mover had, on average, 6,800 more people ($p = 0.000$) and were more likely to have a hospital (beta = 0.081, $p = 0.027$), were more likely to have a greater number of primary care physicians (beta = 0.008, $p = 0.000$), and were more likely to have an ICU (beta = 0.144, $p = 0.000$). Neither grocery stores nor crime had significance. Table 24 details the regression results.

Table 24: Results from Final Linear Probability Model

Source	SS	df	MS	Number of obs	730	
				F(10, 719)	56.48	
Model	68.305	10	6.831	Prob > F	0.000	
Residual	86.961	719	0.121	R-squared	0.440	
				Adj R-squared	0.432	
Total	155.266	729	0.213	Root MSE	0.348	
County has an urban-rural mover	Coef.	Std. Err.	t	P>t	[95% CI]	
Population (scaled)	0.068	0.014	4.91	0.000***	0.041	0.095
Percent Medicare	0.001	0.003	0.43	0.665	-0.005	0.008
Percent Poverty	0.001	0.003	0.44	0.660	-0.004	0.007
Percent College	0.004	0.003	1.51	0.131	-0.001	0.010
Presence of Hospital	0.081	0.037	2.22	0.027*	0.009	0.153
Hospital Beds	0.000	0.000	-0.16	0.873	0.000	0.000
Primary Care Physicians	0.008	0.002	3.97	0.000***	0.004	0.012
Presence of ICU	0.144	0.035	4.18	0.000***	0.077	0.212
Grocery Stores	0.057	0.034	1.68	0.093	-0.009	0.122
Violent Crimes	0.005	0.030	0.16	0.874	-0.054	0.064
Constant	-0.189	0.118	-1.6	0.109	-0.420	0.042

*Indicates statistical significance at the $p < 0.05$ level.

***Indicates statistical significance at the $p < 0.001$ level.

Because of missing data, 730 counties out of 752 (97.1%) were used in the model. The model had statistical significance overall (Prob > F = 0.000), and the adjusted R-squared value was 0.432, indicating that 43.2% of the variation in whether a rural county has an urban-born surgeon could be explained by the variables in the model.

As my first robustness check, a multi-variate regression was conducted excluding counties with RUCCs of 8 or 9, which narrowed the dataset from 752 counties to 463. The same outcomes variable and co-variates were used. The results were nearly identical to those in the final model. Population (0.064, $p = 0.000$), presence of a hospital (0.189, $p = 0.014$), primary care physicians (0.007, $p = 0.007$), and presence of an ICU (0.141, $p = 0.002$) were all

statistically significant. Also as in the final model, hospital and ICU had the largest effect sizes, although all effect sizes were quite small.

For the last robustness check, I used the dataset of the same, less rural counties ($\text{RUCC} \leq 7$), then limited it further to those that have hospitals. Due to collinearity, the indicator variable for presence of hospital was removed; however, all other variables from the final model were retained. The results remained the same as in the final model and first robustness check. Population (0.066, $p = 0.000$), primary care physicians (0.006, $p = 0.017$), and presence of an ICU (0.141, $p = 0.003$) were all statistically significant.

As an extension of this analysis, I isolated the dataset to the most rural counties, $\text{RUCC} 8-9$ that had hospitals. In other words, I wanted to find out how these most-rural counties with hospitals were different from their less-rural neighbors that also had hospitals. The same covariates were applied. Population remained significant (0.109, $p = 0.045$), as did primary care physicians (0.023, $p = 0.004$). Interestingly, presence of an ICU was not significant (0.059, $p = 0.310$). The most interesting difference, however, was that this was the only version of the final model in which proportion of the population that was college educated was statistically significant (0.012, $p = 0.017$). These additional regression results can be found in Appendix A.

Discussion

Research Question 1b, “What characteristics are unique to rural communities where urban-rural movers are located versus where they are not?” allowed us to explore the role demographics, health resources, and amenities may play in general surgeons’ practice location decisions. The univariate and bivariate analyses showed that while few demographic variables were significant, several variables related to health resources and amenities were. However, multi-variate analyses showed that demographics did not play a statistically significant role in

determining whether a rural community attracts an urban-born general surgeon, whereas health resources and amenities did. Within the categories of health resources and amenities, some variables were more important than others.

Less than one-third of rural counties in these analyses, 226 (30.1%), were home to an urban-born general surgeon. Most rural counties with urban-born general surgeons were on the less rural (more urban) end of the rural continuum. Conversely, counties without these urban-rural movers were often those in the most rural classification. Consistent with these patterns, rurality was highly correlated with the presence of an urban-rural mover, suggesting that 53.7% of the variation in urban-rural mover distribution is explained by rurality itself.

Bivariate analyses found that while counties with urban-rural movers did on average have a statistically significantly younger population (a smaller proportion of the population eligible for Medicare), the difference was not significant in practical terms. Both counties with and without urban-rural movers had populations in which more than 20.0% of people were eligible for Medicare. Surgeon – regardless of urban- or rural-born – considering a rural practice would be aware that, in general, rural areas have older populations; this is common knowledge.

Poverty was not statistically significant in a bivariate analysis comparing counties with and without urban-rural movers, but the proportion of the population with four-year college degrees was. Although unemployment was statistically significantly higher in counties with urban-rural movers, it was correlated with the poverty rate – and they are conceptually related – and therefore not included in subsequent modeling. Poverty rates were highest in less rural counties and lowest in the most rural counties. Since urban-rural movers tended to be located in the more populous rural counties, it followed that there would be a statistically significant difference for this variable.

In multi-variate analyses, population itself was significant, but none of the other demographic variables retained statistical significance in the final model. This suggested that factors like age, poverty level, education level, and unemployment rate were not significant considerations as urban-born surgeons decided whether to enter into a rural surgical practice. Some health resources, on the other hand, were robustly statistically significant.

The presence of a hospital is a basic necessity for surgeons, conceptually, practically, and statistically. Nearly every county with an urban-rural mover also had a hospital, and among counties without an urban-rural mover, fewer than 3 out of 4 had a hospital. In multivariate analyses, number of hospital beds was not significant. However, counties with urban-rural movers on average had more primary care physicians than those without such movers. ICUs and ORs were more prevalent in counties with urban-rural movers than without. It was possible that once a county had a hospital, the number of beds was not as important as the intensity of resources – such as ICUs and ORs – that it could provide. This was a point that merited exploration in the qualitative portion of this dissertation. First-hand accounts from surgeons about the importance of resources like these helped us understand whether they thought about their practice locations in terms of quality over quantity of resources or not.

The amenities variables were interesting on their face, and in bivariate testing, all of those selected were statistically significant and had positive directionality. Counties with urban-rural movers tended to have higher median home values, more K-12 schools, more colleges, more grocery stores, more food and accommodations establishments, more general merchandise stores, but also more violent crime arrests. However, several of these variables were too highly correlated with or conceptually related to one another or too sparsely reported to remain in subsequent analyses. Median home values were correlated with college degrees and so were

removed. There was too little data on higher education institutions, and food and accommodations establishments and general merchandise stores were both highly correlated with grocery stores. Therefore, only grocery stores were retained from that group. The amount of missing data in the K-12 variable was problematic, so it was dropped after one initial regression analysis.

The answer to Research Question 1b is that rural communities with urban-rural movers were set apart from those without primarily by their population size and health resources. Communities that had a hospital with an ICU and had a higher than average number of grocery stores, were more likely to be home to an urban-rural mover. Communities should also consider their supply of primary care physicians, although the effect size of that variable was small. These results suggest that for rural communities that are not the most rural (RUCC 4-7) and already have hospitals, investing in surgical infrastructure and health care resources that could increase the complexity of cases managed locally should be a top priority if they want to recruit and retain general surgeons. For rural communities that are the most rural (RUCC 8-9) and have a hospital, the focus should be on maintaining the hospital's capabilities and supporting the primary care physician referral base. For these communities, the population's education level was also significant, so during recruitment visits, efforts could be made to introduce surgeons to other college-educated professionals. The qualitative findings in this dissertation expand on the recruitment experiences of general surgeons and the value of onsite visits.

Limitations of the Data and Analyses

The limitations previously outlined regarding the AMA MasterFile and the calculation of types of movers and stayers applied to these analyses as well. The dependent variable in these analyses was the presence of an urban-rural mover, and if self-reported hometowns and clearly-

demarcated practice locations were available, it would be possible that the identification of urban-rural movers and, therefore, counties with urban-rural movers, could shift.

The analytical techniques here were straightforward. I have relied on t-tests and multivariate regressions in linear probability models. It is possible that with multi-stage modeling, predicting presence of physicians, then presence of surgeons, then presence of urban-born surgeons, we could generate different, or perhaps more precise, results. However, given the limitations of the data, it was unclear that pursuing more advanced statistical techniques would have, in fact, yielded more accurate and practically applicable information. The purpose of Research Question 1a and 1b was to provide basic information on Midwestern general surgeons and communities that have attracted urban-rural surgeons in order to inform the qualitative research stage. That purpose was accomplished with the quantitative techniques applied.

Part III: Qualitative Findings

Introduction to the Qualitative Findings

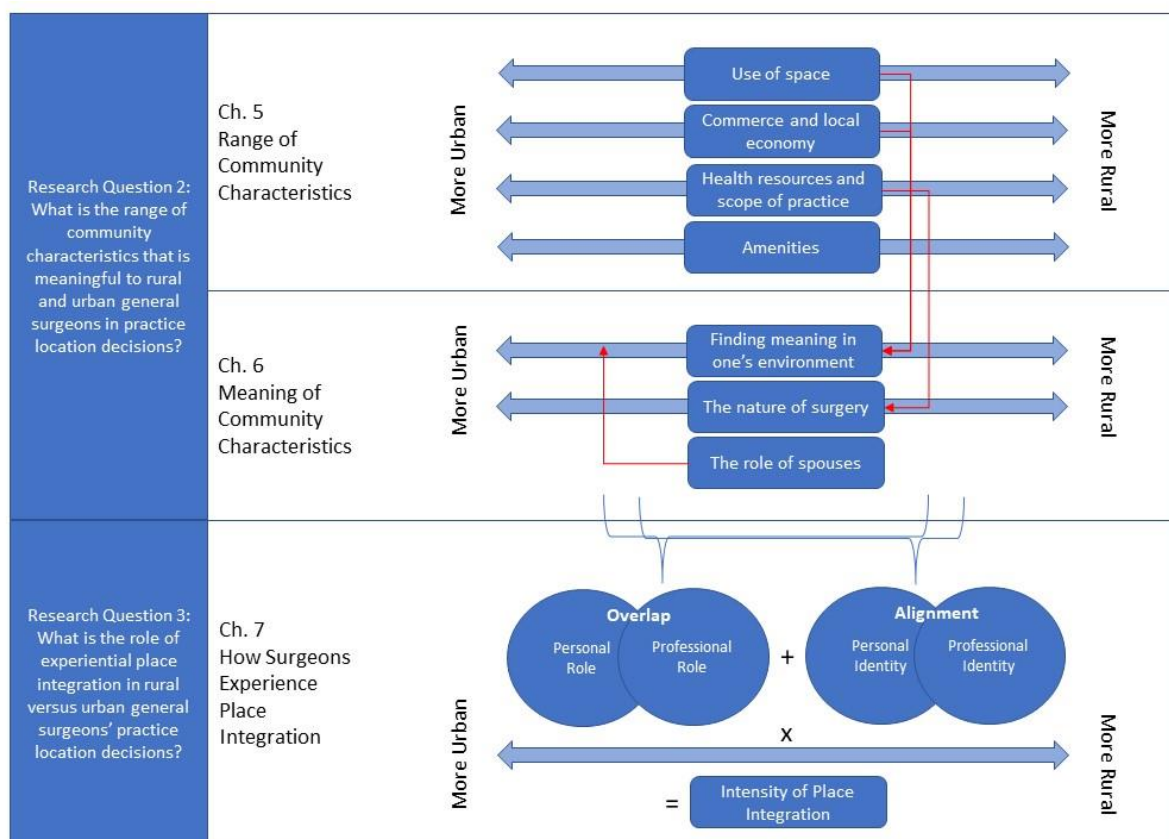
Chapters 5, 6, and 7 present the qualitative data analysis, which was the main focus of this mixed methods dissertation and built on the findings from the quantitative data analysis. Chapter 3 provided quantitative findings regarding the surgeon-level characteristics that may have played a part in why some urban-born surgeons chose rural practice, and why some rural-born surgeons chose rural practice. Birth and current location were used to craft the categories of types of movers and stayers in the quantitative analyses because previous research indicated upbringing was important in determining practice location. The quantitative data also allowed me to explore the role of rurality of medical schools and residency programs, creating a timeline with four points for each surgeon: birth, medical school, residency, and current location. A four-point timeline was an improvement over a two-point timeline and was a step toward constructing surgeons' complex chronologies. However, I was limited in further constructing these chronologies due to a lack of data for many other important points in time such as: childhood home(s), high school, college, and any practice locations between completion of residency and current location.

One of the key strengths of the qualitative data presented in the next three chapters was that they helped illustrate that surgeons' practice location decisions were far more complex than simply moving or staying. In this context, moving and staying were almost misnomers, as surgeons did not go directly from where they were born to where they practiced. In fact, they moved to and from many more places throughout their lives and careers. Qualitative data allowed for a more complete construction of surgeons' chronologies because the data were the surgeons' life experiences in their own words. This allowed for the construction of theory

relating to why they choose rural and urban locations across their lifetimes. Paired with the quantitative findings, I was able to draw conclusions about surgeon-level and community-level effects that could be useful to a wide range of audiences interested in ameliorating the rural surgeon shortage.

Figure 12 is a visual representation of both the theory this dissertation develops and how the qualitative findings are presented and discussed across Chapters 5, 6, and 7.

Figure 12: Theory Development from Qualitative Findings



Chapter 5 focuses on the range of community characteristics identified by surgeons in the qualitative sample as having been factors in their practice location decisions. These data are meant to be somewhat one-dimensional, providing basic context for many of the community characteristics identified by the quantitative data in Chapter 4. These themes are built on

straightforward statements by surgeons in the sample about what tangible community factors they and their families considered as they made practice location choices. The qualitative global themes were the foundation of subsequent discussions in Chapters 6 and 7 about the meaning of community and the role of experiential place integration for rural and urban surgeons in this sample.

Review of Qualitative Methods

In order to determine the role of community in Midwestern general surgeons' practice location decisions, in-depth, semi-structured interviews with urban and rural surgeons were conducted. The data were coded according to the codebook as described in Chapter 1. The codes analyzed described: how surgeons thought about urban places, how surgeons thought about rural places, the verbiage they use to compare places, what their surgical practices were like in terms of scope, and what they thought about amenities. Each code was cross-tabbed with the interviewee's current, self-identified type of practice location. This allowed the data to be divided by the surgeon being in rural or urban practice in order to explore how their perspectives were similar or different. Of the 37 qualitative interviews conducted, 22 self-identified as rural surgeons, and 15 self-identified as urban surgeons. The types of movers and stayers by self-identification, as first identified in Chapter 1, are presented in Table 25.

Table 25: Locations of Interviewees by Self-Identification

	Grew Up Rural (Self-Ident)	Grew Up Urban (Self-Ident)	Totals by Type of Practice Location
Currently Rural (Self-Ident)	16	6	22
Currently Urban (Self-Ident)	9	6	15

Within each code, I determined basic themes from the rural surgeons, who were the main focus, and the urban surgeons, for comparison. These basic themes were consolidated into broader,

organizing themes. The organizing themes from each code, for rural and urban surgeons separately, were brought together to establish global themes for rural versus urban across these place-related codes (Attride-Stirling, 2001). These global themes emerged from the data; they were not constructed based on the previous quantitative analysis (Charmaz, 2014; Corbin & Strauss, 2015).

The factors in the quantitative analysis that corresponded most closely to the qualitative global themes were: rurality, demographics such as poverty and unemployment rates, health resources such as presence of hospitals and ICUs, and amenities including K-12 institutions and retail establishments. The purpose of utilizing the quant→QUAL sequence was for the smaller, quantitative analysis to inform the larger, qualitative analysis, but I must emphasize that the quantitative variables did not determine the outcome of the qualitative analysis. The interview guide had been completed and used in pilot interviews prior to the start of the quantitative analysis. The results of the quantitative analysis were useful in the qualitative sampling, but they were not used in determining the codebook. The three groupings of the quantitative variables – demographics, health resources, and amenities – provide a helpful order to use in presenting the qualitative results, but the coding and analysis were rooted in grounded theory, which demanded that the qualitative data themselves governed the codes and themes that emerged (Charmaz, 2014; Corbin & Strauss, 2015).

Chapter 5: Community Characteristics That Matter

Introduction

Urban and rural surgeons discussed four global themes which form the range of community characteristics considered in their practice location decisions: the use of space, commerce and the local economy, health resources and scope of practice, and amenities. Since the urban surgeons served as a comparison group, I presented each global theme first from the rural surgeons' perspectives, followed by the urban surgeons' perspectives. When I used the terms "movers" and "stayers" in these qualitative results, I was using the surgeon's own self-identification of his or her locations. This was different from the RUCC classifications used in the quantitative analysis. Since RUCC was a county measure, there were some counties that included part or all of a large city (resulting in an RUCC of 1-3), but within the county, there may have been surgeons in smaller towns far enough away from the large city who perceived themselves as rural surgeons ("Rural-urban continuum code, 2013," 2013). Notably, there were no inconsistencies between urban RUCCs and surgeons' perceptions of those practice locations as urban. It was only in less urban/more rural practice locations where there were discrepancies.

Findings

The use of space: The rural surgeon perspective. Rural surgeons emphasized that rural places were on a continuum from less to more rural and should not all be characterized the same way. Overwhelmingly, describing rurality as a continuum was the dominant way rural surgeons talked about small places. They discussed the complexity of defining what rural really was and most expressed – in various ways – that it involved population size, resources, and relative isolation from other towns, including isolation from those other towns' resources. One rural

surgeon talked about where he grew up, characterizing it as, “probably the extremes of what rural would be defined as.” He described where his family’s farm was:

And our farm was probably about seven miles from the nearest town, which was maybe about 80-100 people. And the nearest town with a grocery store, or, you know, hardware store, would’ve been about half-hour away. So very rural. Farming community, wheat fields, and uh, houses were half-mile apart for the most part.” – Rural, Pilot #4

This surgeon was a rural-rural stayer from a county with an RUCC of 9 now practicing in a county with an RUCC of 7, meaning on paper he is no longer in “the extremes” of rurality. His comment here focuses on distance, although he does mention amenities, which will be discussed later. Another rural surgeon, who also grew up in a rural county on a farm, compared his perspective on rurality with his spouse’s perspective, who grew up in a larger town:

It’s all in the eye of the beholder. I, of course, don’t feel rural here, because I was raised where you would go out at night, and you could see the stars, and there was no streetlights, and you didn’t hear any sounds... I mean [spouse] probably feels more rural than I do because she was raised in a little [town name]-type town... – Rural, #7¹

For him, less-developed space – or, more wide-open space – was tied to sights and sounds like stars and streetlights and noise. He stated that because his wife was from a larger though still small town, her perspective on these sights and sounds and therefore “what rural is” was different.

Rural surgeons in general saw traffic and crowding as inconveniences and eschewed what they perceived as busy, hectic spaces. They tended to like that their current places included less concrete and not only man-made green spaces, but open fields and naturally beautiful

¹ When location names are removed, [town] is substituted to indicate a smaller, more rural place, and [city] is substituted to indicate a larger, more urban place.

landscapes. They said the opposite about urban places, stating they had experienced more concrete and a lack of green space in urban areas, which they found unappealing. One urban-rural mover described the more urban area in which he grew up:

[I]t was a, basically a suburban area on the east side of [city] [...] rows of houses, streets, you know [...] and um, the most outdoors really knew was, was uh, at the end of the neighborhood was a city golf course, and that was the most outdoors you really could experience. – Rural, #11

He then contrasted this urban location with his current, rural location, in which he said there was more green space. He talked about having seen more wildlife in his current setting than he ever had growing up. Other rural surgeons also brought up wildlife, some discussing hunting either during their upbringing or in the present, and all conveyed an affinity for the land and animals living there. One urban-rural mover talked about how novel wildlife were for him when he first moved to a rural area:

[T]he first time I came here [current rural location], and I saw a hog, a pig, I had to take pictures. I had never seen an animal like that. I mean, other than a pigeon in [urban area], what... to see a deer? Oh my God. – Rural, #3

He made it clear throughout his interview that he enjoyed the contrast between his urban hometown and his current rural location. He stated that his spouse, who was from their current rural location originally, “likes the green,” reiterating the importance of the natural landscape.

The use of space and role of the outdoors was pervasive throughout rural surgeons’ discussions of children in rural areas, whether they were referring to their upbringing, their children, or their grandchildren. They repeatedly referred children being able to ride their bicycles in small towns without the children or their parents being worried about safety. One rural-rural stayer discussed his experience growing up:

None of our parents worried about what we did. We [sic] just go hang out with friends, usually have someone that lives across town, and ride your bike, go hang out with them. And there was never a concern, you know? We knew everybody

that lived down, or up and down our block, I think. All of our neighbors would constantly go back and forth... there's never any concern on that. – Rural, #14

It was clear this surgeon valued the ability of children to act independently at early ages, within the confines of a community he perceived as safe. Similarly, another rural-rural stayer talked about how his children were able to roam around town independently:

My 8-year-old hops on his bike, goes to the pool by himself, he hops to the grocery. You know, you can't do that in a city. He'll just take off on his bike, go all over town with his friends, and you just can't do that so much... and there's no traffic, and you know, there's less people out here. It's just what we like... there's a lot of perks. – Rural, Pilot #5

Surgeons' statements about children biking were primarily about the safety of rural settings, but that safety was possible due to the more tightly-knit social fabric of smaller towns. Additional benefits, as well as disadvantages, of this kind of social fabric will be explored in Chapter 6. For most rural surgeons overall, more open space, a greater proportion of green space, the presence of wildlife, and less traffic all were identified as characteristics of communities where they would like to live.

In discussing urban areas, rural surgeons acknowledged that cities were not monolithic. They had experienced – mostly during their education and training – that each metropolitan area had many different parts and a city was, in fact, more like a conglomeration than one big town. When they discussed specific urban neighborhoods, they usually did so in order to point out which areas were safe and which were not. For example, one urban-rural mover talked about having been present in a big city during training at a time when the Mafia was still active, and he said, “you stay away from certain places” (Rural, #22). One rural-rural stayer discussed a city he experienced during residency that had several different areas, some of which he felt were similar to his rural hometown:

[I]t was a big difference to me, yeah. Also came with traffic and crime and uh, the neighborhood around the college, the medical school at that time was pretty seedy... there were a coupla neighborhoods in my hometown like that. You didn't go at night, but, not like this. Big time. And then, you know, doin' trauma rotations, the things you see, the worst of any big city... It was, was a different feel. – Rural #13

Importantly, he points out that there was crime in his hometown, too, but then he indicates the magnitude of the difference between his hometown and his residency location by saying, “not like this. Big time.” He was able to identify different neighborhoods in the urban area and also that it overall had a “different feel” from where he grew up, in spite of any other similarities that he saw. Although rural surgeons were more likely to articulate how rural areas existed on a continuum and that even towns of the same population size were not identical, some were also able to identify these same kinds of differences across and within urban areas. This reinforces the importance of considering urban and rural as a continuum, which according to these surgeons is a more accurate representation of their lived experience, as opposed to a binary concept.

The use of space: In comparison, the urban surgeon perspective. In the same way that rural surgeons emphasized rurality was on a continuum, likewise urban surgeons emphasized urban areas existed on a continuum. One urban-urban stayer countered the big-city stereotype and said, “there is a neighborhood feel to it; they’re not all high rises” (Urban, #25). One rural-urban mover discussed how he thought about the differences between cities as he was making decisions about training and later about practice locations:

I wasn't crazy about [the prospect of] living in New York, okay? Because New York, I mean, Baltimore's a big city, but New York was like other-wordly... 'Cause like, Baltimore, if you drive for 5 minutes in any direction on the interstate, you, like, see green stuff. And New York is not like that. It's a different kind of urban area. And definitely was intimidating. I needed to be able to see

green stuff within like 5 minutes... You can drive for hours and not see anything but concrete, so that was definitely a turn-off for New York. – Urban, #17²

This surgeon had been raised in a rural area, which could explain his affinity for “green stuff,” and although he welcomed living in an urban environment during training and eventually located permanently in an urban county, he drew a distinction between different kinds of metropolitan areas, separating most from New York City, which he perceived as being on the extreme end of the urban spectrum.

The surgeon mentioned being able to drive and find a change of scenery, which raises the topic of traffic. Urban surgeons, overall, did not associate the same negative value with crowding and traffic that rural surgeons did. They accepted both as part of life and had learned how to navigate them. One urban-urban stayer articulated his major considerations in his practice location choice:

I think my idea of community involves not only, you know, the people, but also... the resources of the location... and the, the ease of, I mean, I, I was about to say ease of transportation, although...it's horrible, so you just don't drive in [city], that's the key. – Urban, #25

In the same breath that he mentioned the value of community and resources, he also mentions transportation, indicating it was important, perhaps even in the top three factors in his practice location decision. He admitted, though, that trying to drive in his city was “horrible” because traffic was so congested. His solution was to avoid driving entirely.

Like rural surgeons, urban surgeons also mentioned green space in discussed about their practice location decisions, though they focused on man-made green spaces rather than the

² Location names are included rather than blinded here because they do not reveal this surgeon’s previous or current locations, and they are important to understanding this surgeon’s meaning.

naturally-occurring landscape. One urban surgeon recalled things she noticed and had been told during her onsite interview at her now-current practice location. She said, “I partly loved just how green it was and how... just, super easy to get around and, like, you know, the park’s right here” (Urban, #5). She went on to discuss the visit more in-depth:

The other thing people talked about is... there’s a lot of fun, free, family-oriented things to do here. So there’s, you know, [city park], everything that’s in it is sort of free, if you’re a county resident, you go to the zoo for free, all these things. Like, people just said it’s a great place to enjoy your life outside of work because there’s lots of good, fun things to do, you know, all kinds of festivals and fairs. Yeah. Farmers markets and all that stuff. – Urban, #5

For her, the outdoors was a community characteristic that factored into her practice location decisions not only for its own sake but because of its ties to family activities. This association of meaning with the outdoors will be explored in more depth in Chapters 6 and 7.

Hardly any urban surgeons mentioned children roaming independently without adult supervision. Some of them, who grew up in rural areas, recalled being able to do this as young children. Others, who are parents now, noted they drive their children everywhere. One urban-urban stayer talked about being able to ride his bike growing up in a suburb, and he drew a clear distinction between that neighborhood and the urban core. He also shared that his children can ride their bikes in the suburb where he and his family currently live, which set him apart from other urban surgeons with children:

I have always liked, uh, living in locations that feel like they’re built to have people interact... you’re not in some closed-off... subdivision where, in order to, you know, get anywhere you have to get in your car. [...] Communities like that... no mix between residential and commercial... that doesn’t feel like a community to me. ... The suburbs that I tend to like are the ones that have a downtown, you know, have ease of access to things, that you can walk to or ride, you know, my kids can ride their bike... I just like that idea. I don’t like the idea of being trapped in my car all the time. – Urban, #25

Like the rural surgeons who brought up children and biking, this topic seemed more related to a

community's social fabric than the act of biking itself. This suggests that some rural and urban surgeons share the same values related to social fabric, which, again, will be explored in greater detail in Chapters 6 and 7.

Urban surgeons shared rural surgeons' acknowledgement that urban areas are conglomerations, with different areas of town having unique or identifying characteristics. They sometimes used the word neighborhood and sometimes bifurcated the environment into 'the city' and 'the suburbs,' as rural surgeons did. They acknowledged that urban areas tend to have more traffic and be more crowded, but some urban surgeons said this higher density allows for co-location. Because cities had different areas, they could choose to co-locate their personal and professional activities, which from one surgeon's perspective increased convenience and also created a sense of community. Other surgeons, though, identified the opposite as a benefit: a city's many parts made it possible to geographically separate one's personal and professional roles. They could live in one area, work in another, and even live and work in several areas by having various locations for family and social activities and practicing at multiple hospitals. By in large, urban surgeons saw the patchwork nature of urban areas as a positive characteristic, allowing for flexibility in personal and professional choices.

Notably, one urban surgeon brought up that he has "no basis for comparison," when it came to different practice environments. He did not train nor had he practiced in any rural environments, therefore he felt he could not compare urban to rural. It bears repeating that most medical education takes place in urban centers. It is possible for an urban-born surgeon to choose an urban location without ever having been exposed to any other type of place. Surgeons who are born in rural areas, however, are almost guaranteed to be exposed to urban areas during training.

Commerce and the economy: The rural surgeon perspective. Rural surgeons recognized that larger towns tended to have more diverse economies than smaller towns. They also expressed that while urban and rural areas both had the potential to grow or decline, they perceive that urban areas' diversity of industry gives them economic resilience. Smaller towns generally lack such economic diversity and therefore are more subject to the ups and downs of the market. One surgeon identified that healthcare and education have become the dominant industries in her community, saying:

[W]hen I first came here... very big mining population, the biggest employer was the coal mines. And, uh, then they closed. And then, farming has evolved, and many generations have no one to leave their farms to. So the biggest employer right now is healthcare. And education. So, they go hand in hand. They're symbiotic here. – Rural, #16

This same surgeon at several points demonstrated that she cared about the economic future of her community. For example, she discussed her service on a local higher education institution's board, her involvement in training surgical technologist students, and her key role in expanding the hospital's cancer center. Like her, though, most rural surgeons in this sample did not speak explicitly about economics. They tended to identify industries besides healthcare that played major roles in their communities' well-being, past or present. They discussed their communities' abilities to invest in infrastructure and what they considered to be outward demonstrations of a healthy economy, such as a vibrant downtown or visually attractive housing and neighborhoods. For example, one rural-rural stayer said:

The downtown area is just beautiful, um, it's, it's very unusual. Because every storefront mostly is filled, and it's busy and vibrant. – Rural, #13

He noted that having every storefront filled was an anomaly for small towns, acknowledging that many small towns suffer from less vibrant economies. Along these same lines, other rural surgeons discussed that housing stock quality and the visual appearance of community

infrastructure mattered to them as they chose their practice locations. One rural-rural stayer, who said she had always wanted to practice rurally, stated poor housing stock nearly stopped her from accepting a contract in her second practice location:

[W]hen I went to [rural town], I mean I visited twice... networked everywhere and trying to find a place to rent. And couldn't find any place that had a shower. And I was real close to signing the contract, and it finally... I said, like, "[Hospital administrator], I don't want to be snooty or whatever, but... if there's no shower, there's no contract." – Rural, Pilot #2

She did eventually find an acceptable house and ended up staying in the community for more than 15 years. Her situation is a prime example of how the well-being of a small town's economy and infrastructure can be a barrier to rural workforce recruitment. Once overcome, however, this town was successful in its recruitment of this surgeon.

One rural-rural stayer had trained in urban locations and very briefly practiced in a more urban location. He spoke more generally about the appearance of small towns, saying that when he was looking at practice locations, he did not want to live in a "dumpy" place. When pressed about what that meant, he elaborated:

Unfortunately, as a young person, it's... completely the way it looks. [...] Each community has its own culture, and its own leadership and uh, the, there're definitely communities who are winning the battle of staying up and investing in their town and others who are not. [...] For instance, I interviewed in [town] ... and they had a community center... brand new, and it was clear, you know what, raising a family, I could see myself living here, because... they're investing in the community. So, the dumpy would be the opposite of that. – Rural, Pilot #1

For this particular surgeon, appearance translated into the quality of a community's infrastructure and its attitude toward quality of life.

Although it was clear rural surgeons understood their presence meant their hospitals could provide more services (which will be further discussed in this chapter, under health resources, as well as in Chapter 6), they almost never explicitly discussed the connection

between their presence and the economic ripple effects of providing surgical services locally. As a factor in rural surgeons' practice location decisions, the economic condition of a town was an underlying factor, driving other, more visible manifestations of that condition such as housing quality, infrastructure, and health resources.

Commerce and the economy: In comparison, the urban surgeon perspective. Urban surgeons agreed with their rural colleagues that larger towns tended to have more diverse economies and, while those could grow or contract, urban areas had a tendency to grow and be more resilient. Also, similarly to rural surgeons, urban surgeons did not explicitly draw connections between their presence or surgical services and their city's economic well-being. While a community's local economy was important to both rural and urban surgeons, the reasons for its importance differed. Rural surgeons tended to look for the manifestations of a healthy economy, such as good-quality housing, good infrastructure, a 'vibrant' downtown, and health resources. Urban surgeons did not connect economic well-being to these outward manifestations. They seemed to take their local economies somewhat for granted, recognizing that greater diversity in industry yielded greater economic resilience. For urban surgeons whose spouses worked outside the home, they were more likely to point out the connection between their city and their spouses' careers, but this will be explored in Chapter 6 in discussions about spousal perspectives.

Health care resources and scope of practice: The rural surgeon perspective. There was broad consensus among rural surgeons that in smaller places, there were fewer health resources, from other doctors to staff to supplies and equipment. Many of these resources could be grouped together and called surgical infrastructure, but the term health resources will continue to be used

because it encompasses the presence of other physicians, such as referring primary care physicians.

The quantity and mix of these resources affected the scope of surgical practice possible. Having fewer physicians and surgeons, for example, usually meant a general surgeon needed to maintain a broad scope of practice. Basically, they needed to cover ground that in more populous places would be covered by other specialists or even sub-specialists. Resources, though, could limit the level of complexity in cases they could manage; their scope might be broad but the level of risk could be low. Staff, supplies, and equipment were reported to have similar effects. With more highly-trained staff and more advanced equipment, more complex cases could be done, whereas with fewer staff, staff with less-advanced training, and less-advanced equipment or technology, fewer complex cases were usually done. When surgeons completed residency, they reportedly were considering what type of practice they wanted, and at the heart of this question was what breadth and complexity of cases they wanted to do. Therefore, as they considered various communities, they had to think about the range of health resources available.

Rural surgeons reported having a wide range of resources. Some felt they had everything they needed, while others expressed a desire for more or different resources. One rural surgeon was so confident in his and his partners' abilities that he said the only specialty they needed in town was urology. It should be noted that he and his partners considered themselves surgeons who also served as their patients' primary care physicians:

The other stuff we all do ourselves. We don't need gynecologists 'cause we do our own gyney [sic], you know? So, we do all that stuff. We don't need, you know, we do our own cardiology, we do all of our own stuff. So, but the urology thing, you know, if someone showed us how to use a cystoscope, we'd probably start doin' 'em ourselves, you know? – Rural, #8

Other rural surgeons concurred that they had broad scopes of practice but made it a point to say it was important to them to have another surgeon's assistance on complex cases. One rural-rural stayer was basically in solo practice, with only a part-time partner who visited from an urban area on select days, and he talked about his transition from residency to rural practice:

Anything I thought was gonna be challenging I tried to do it a day when [part-time partner] was there just in case, so he could run across the street and help me if need be. But you know, a lot of stuff comes in in the middle of the night, and you have to just take [it], and it was challenging. – Rural, Pilot #5

Another rural-rural stayer shared this view that having another surgeon available to assist was important in cases that were done less frequently. He suggested the surgeons in these situations were working from combined knowledge; it was a 'two heads are better than one' mentality.

When I interviewed him, he had a case like this coming up the next day:

You kinda do what they [referring physicians] ask you to do... Some of the bigger cases that we don't do very often... they're not that technically difficult. [...] And we'll get through it. [Partner]'s gonna be there, and it's another one of those cases where it's nice to have two surgeons instead of one when you don't do 'em as often. – Rural, Pilot #4

By having another surgeon's assistance, rural surgeons were more confident in their ability to manage less-frequently done cases. If their confidence were lower, they might decide to transfer these cases to other hospitals, effectively narrowing their scope. In this way, additional surgeons are resources that play a key role in determining rural scopes of surgical practice.

In addition to discussing the importance of having another surgeon available for more complicated or less-frequent cases, rural surgeons stated that resources such as ICUs and blood banks were critical. With those resources, they could manage a wider variety of cases and more complex cases; without them, they could not. One rural-rural stayer said that her own skills were usually not what governed her scope. Instead, it was the resources available for pre-operative evaluation, intra-operative resources, and post-operative care. She said:

[W]hen I got rural, it's like, okay, it's not that I can't do the surgery. Should I do the surgery? And what do I have? Do I have what I need to take care of the patient around the time of the surgery? –Rural, Pilot #2

This rural-rural stayer, who had gone from a less rural to a more rural environment – hence her word choice, “got rural” – emphasized that skills and resources were two different matters. She was confident in her surgical skills, but her skills alone could not overcome certain deficiencies in resources.

Even with an ICU and other resources, there was a question among rural surgeons of whether nursing and support staff were appropriately trained to care for acutely ill patients.

When I came out of residency, I could do all kinds of crazy things. I could do all kinds of surgeries, but my hospital, and my staff, could not. [...] There's a lot of education to be done when you come into a hospital that doesn't do a lot of surgery... my office nurses didn't know what a hemi-colectomy was when we started. [...] I think it's more important to educate in a rural hospital, educate the nurses, educate the techs, on all levels. Because we're doing things that they're not comfortable with, at first. We need to get them comfortable so that they take good care of patients. – Rural, Pilot #3

This surgeon said she worked with nurses and staff to make sure they had the tools – including knowledge – they needed to do their best work. She discussed the importance of assessing available resources in order to determine the scope of practice best for her and her hospital. Rural surgeons reported that if they determined there were not adequate resources to care for a patient before, during, and after a surgical procedure, they would not perform the procedure and instead would send the patient on to a higher level of care in a larger community. It is effect of health resources on scope of practice that is more important than the resources themselves.

Health care resources: In comparison, the urban surgeon perspective. Urban surgeons agreed with rural surgeons that rural areas generally have fewer health resources and urban areas generally have more. Some knew this from past rural experiences, usually rural rotations in medical school or residency. For others, their perspectives where shaped by patient transfers

received from rural areas or having discussed this issue with rural colleagues. Urban surgeons understood that rural surgeons' scopes of practice were affected by resources, but they did not speak to this relationship between scope and resources with the same frequency or in the same depth.

In urban areas, there tended to be more healthcare resources such as intensive care units and blood banks, allowing for more complex cases. Larger cities also tended to be the homes of academic centers, which typically had numerous and advanced resources in terms of staff, equipment, and technology. Urban surgeons, particularly those from the largest metropolitan areas, identified that in an urban environment, there was pressure to sub-specialize, and it was difficult to maintain a broad scope of practice.

[Past mentor] was also a general surgeon. He did all sorts of procedures. That type of practice is not realistic in today's environment... particularly in an academic center, so you have to be more focused. – Urban, #28

This surgeon was not the only urban surgeon to point out that urban scopes of practice have narrowed over time. They observed that phenomenon for all urban surgeons over time, but they also noted the phenomenon within their individual careers. Some started out with very broad practices but narrowed over time, sometimes quickly, within just the first few years of practice. The surgeon quoted above was from an academic practice in a county with an RUCC of 1. To provide some contrast within the urban environment, however, a surgeon in a community practice in a county with an RUCC of 3 pointed out that he is actually able to maintain a broad scope of practice.

I'm pretty broad, um, endocrine like thyroids, parathyroids, that's the nice thing about this community. It's very unique, and when I say it's unique- um, most communities the size of [city] have their general surgeons... mainly do just gallbladders and hernias. Here, we're trained and also expected to be able to do cases that, you know, a surg-onc doc would do or an... endocrinology surgeon

would do, stuff like that. We're expected to do, to be able to do those, and so it's nice to keep a broad spectrum. – Urban, #32

It is notable that this surgeon thinks his community is unique and stated he believes other large cities typically curtail the scopes of practice of their general surgeons. The experiences of these two surgeons – in RUCCs of 1 and 3 – reinforce the importance of viewing rural and urban areas on a continuum. For urban surgeons, the factors governing their scopes of practice were not primarily resource-related; they generally had access to any resource they needed. Instead, those who experienced a narrowing of their scopes of practice tended to be in the largest cities, in academic practices, or in practices in which the partners had decided to specialize among themselves. The experience of one urban surgeon in a community practice exemplified both the quick narrowing of a practice and specialization within a practice. While she still considered herself a general surgeon, breast surgery had become an increasingly large share of her practice.

I very quickly, um, began doing lots and lots of breast surgery, which is fine... So now, over 50 percent of my practice is breast. [...] I do endoscopies, um, which lots of general surgeons don't, but we all do endoscopies, our whole group does. Then I do general surgery, trauma surgery, but over half my... elective practice is breast surgery. – Urban, #31

This narrowing of scope – whether over a long or short period of time – and specialization within a practice were not found among rural surgeons, and involvement in academic practices was less frequent as well.

Amenities: The rural surgeon perspective. Rural surgeons discussed a variety of amenities, from K-12 schools to restaurants and cultural activities. First, I will present education, then all other amenities. I will close with a discussion of crime since it ties to rural surgeons' previous statements about different neighborhoods and children being able to be independent.

Rural surgeons' attitudes toward K-12 education in smaller communities ranged from neutral to positive. Some rural surgeons expressed great confidence in their local public schools

and stated it was clear their communities strongly supported education. Some rural surgeons chose to send their children to private schools, which were either in their small towns or in reasonably-nearby (in their judgment) towns. One rural-rural stayer discussed considering his practice location and its schools:

I don't think it was a magic number as far as the population or the number of stoplights or the size of the schools or anything... I'd heard about the [annual festival], a community that supports its children, and you see that in the parks and the schools, both Catholic and public schools. So, I think that stood out.
– Rural, Pilot #4

This annual festival the surgeon mentioned revolved around the local schools, and he took it as an outward sign of community support for children and education. For him, it was not quantity of schools that was important, nor quantifiable measures of quality, but the general community supportiveness. His own children attended Catholic schools in the town where he and his family lived and he practiced, and he was confident his children were receiving a good education.

Another surgeon noted that his spouse had reservations about living in the town where he planned to practice, primarily because of its lack of faith-based schools. For this reason, he and his family chose to live in a larger, nearby town where faith-based schools were in close proximity, and the surgeon commuted a short distance to his rural practice. He discussed his spouse's initial concerns and how he came to feel about their choices:

[B]ut living in [practice location] here, that was gonna be an issue, my spouse being from [city], it was like, "No. This ain't gonna work. Our kids are going to private school." ... I don't mean just private, I mean faith-based school. She felt extremely strongly about that. In retrospect, thank goodness... 'cause I'm so happy we did. It couldn't be better for them in that regard. – Rural, #9

While schools did not govern his practice location, they did affect where he and his family chose to live. Access to faith-based schools could have been a barrier to this surgeon locating in his now-current practice location, but he was dedicated enough to practicing rurally that he and his

spouse found a solution. While Rural Pilot #4 had expressed confidence in both the public and private schools, Rural #9 and his spouse felt far more strongly about private schools specifically. From these data, I have concluded that surgeons decided first to practice rurally, then they made decisions related to their children's education.

Regarding other amenities, some rural surgeons said that even in small towns there could be more amenities than what they grew up with, like this rural-rural stayer whose family farmed for many generations, and whose husband farmed:

A Wal-Mart and a grocery store is more than I had when I was a kid, so it's really not that big a deal. I don't, I don't need the big city. I didn't enjoy the big city either. – Rural, Pilot #3

For someone like her, even a small town with a few amenities was a place with plenty of choice, whereas for those who grew up in urban areas with many more choices, an adjustment to fewer could be more difficult. Overall, choice and variety among amenities were not very important to rural surgeons. Some indicated they spent all their time working, so even if amenities were readily available, they would not use them. One urban-rural mover was comparing a nearby, larger town to his small town and said:

[Larger town] has a college football, it has restaurants, it has the shopping, it has all the things that spouses would want, you know? If you wanna go to Macy's and Nieman Marcus and stuff, there's shopping. Now, as a busy surgeon, did that matter to me? No. I was busy. – Rural, #3

For rural surgeons who did want to partake of amenities like restaurants, shopping, and cultural events, most did not see living in a rural area as hindering their access to these. As long as amenities were available in other, relatively nearby towns, they did not see a need for them in smaller communities. Access, to them, meant the ability to get in their cars and drive to the amenity of their choice.

It was rural, and we were both happy with that type of environment. And we were hour and 20 minutes from [city] ... So, if we wanted to go up to a play or something, we still had access to that. I mean, we had interstate access, half an hour to [town], you could be in [city] in no time with no traffic. – Rural, #7

Some rural surgeons even said it was better to live in a smaller place, with less access to amenities, because they perceived more access as potentially detrimental, particularly for children. One rural-rural stayer reflected on his own childhood and said that if he had had more access to “things to do,” he probably would have only gotten in trouble. He said:

I certainly have never felt like, gee, I wish I lived in a big city and grow up there. It was, like, there's more excitement and things to do and all this, you know? That would be kinda fun, um, but most of the stuff that I wanted to do, I shouldn't have been doin.' I mean, it was, you know, like, stupid stuff with cars or booze or whatever, you know, like a teenager. – Rural, #10

While some might argue there are just as many ways to get into trouble in a rural area, this surgeon's perception was that trouble would have been more easily accessible in a large city.

In general, rural surgeons recognized urban areas had more choices in amenities and were in closer proximity, but they did not express a preference for more choices and closer proximity in amenities in their own lives. To some rural surgeons, the number and type of amenities were indicators of where a small town was on the rural-urban continuum. Those towns with more amenities were less rural, and those with fewer were more rural. One rural-rural stayer described her hometown mall:

I think in [hometown] there was one mall, that didn't even have all the stores filling it. Um, and most of your chain restaurants and you know, but not a whole lot. Anybody who wanted to do significant shopping or eating went to [city]. – Rural, #15

While she indicated that people in her hometown would go to a larger city for “significant” choices in amenities, she did not say there was a desire or need to travel there frequently.

Similarly, one urban-rural mover talked about how vacationing in larger places gave her the opportunities she needed to access a wider variety of retail:

[Vacation] gave me an opportunity to go shop at big stores in Chicago or New York City or wherever we were. That gave me that, um, fix I need, 'cause there's, the only store we have right now in [town] is Wal-Mart and Peebles, which is, you know limited. Which is fine. My favorite store's Odd Lots... I live within my means, but it is nice to go to a big- big city and go shopping. – Rural, #16

It was interesting that surgeons sometimes used specific company or brand names to indicate where on the rural-urban continuum they placed an area. Wal-Mart was usually a hallmark of smaller towns that were large enough to have some retail. Target was considered a step up and was usually located in a nearby, larger towns. Department stores were almost exclusively referenced as present only in urban areas.

Lastly, I will present rural surgeons' perspectives on crime. In the results about use of space, rural surgeons made note of some urban neighborhoods having more crime than others. The most important point about rural surgeons' perspectives on crime is rooted in the fact that most surgical training takes place in urban areas and includes a great deal of trauma care. All surgeons are exposed to trauma, but this qualitative data suggests it is possible this exposure has an out-sized effect on those who are from a rural area. This may be true regardless of where they want to practice, but the effect is perhaps even greater on those who are from a rural area and want to return to practice in rural areas. Rural-rural stayers' only exposure to urban living and urban practice occurs during training, and if training consists of significant exposure to trauma, then trauma is a significant part of their only exposure to urban life. One surgeon who perceived himself as a rural-rural stayer talked about his training in an urban setting this way:

It's too much violence and, everybody shot up and high-powered weapons, and it's like holy crap, you know?... Now it's blast injuries, and, you know, AK-47s and, I mean, the things, everything's dead insides. It's like, God, who wants to do

that, you know? And so much recidivism. Those people all come back, shot up, and, you know, you can't cure 'em of that stuff. – Rural, #8

In his mind, not only was caring for repeat trauma victims unappealing, but the nature of the injuries was truly horrific. He expressed that he did not want to do that type of surgical work, nor did he want to live in that urban environment. He had, in fact, been offered a job there, and he turned it down to return to his rural hometown. Another surgeon who perceived himself as a rural-rural stayer said explicitly that his experience with trauma during training shaped his impression of that city:

At that time, you know, the knife and gun club down there in [city] was horrible... It's not like that now, I don't think. A lot of their stuff down there's more blunt trauma, car accidents, but back then, it was all knife and gun stuff... That... was my impression of [city], kind of a violent city. – Rural, #9

One urban-rural mover also had personal experience with crime in a large metropolitan area, which was one of his first practice locations:

[M]y house was broken into, and they took 20,000 dollars' worth of stuff and broke what they didn't take. And my boy got held up at gunpoint at the mall at Christmas shopping, and got in his face, and took everything he had. And after that, I thought, I'm outta here. – Rural, #22

Both he and his son had been victimized, and although he had grown up in an urban area and trained in urban areas, these experiences soured him on urban living. Personal experiences as victims were rare among these surgeons, however. Far more often the recounted their experiences with trauma during training forming their opinions of urban areas either in general or in the specific.

Amenities: In comparison, the urban surgeon perspective. Regarding K-12 education, like rural surgeons, urban surgeons spoke about community support. However, they were less optimistic than were their rural colleagues. Some expressed doubts about rural students going on to pursue higher education, which did not stem from doubts about the abilities of the students at

all. Instead, they questioned whether communities' support and resources were sufficient. One urban surgeon who perceived she had grown up in a more rural area discussed her high school education this way:

I would say maybe 10 percent of us went on to actual four-year college, and three of us went out of state, if that gets you a sense for things. I never felt particularly limited by my experience, partly because, you know, I had a mother who made sure we were educated. – Urban, #5

While she felt confident her own education was well-rounded, she attributed that to her mother, and she was not confident her classmates were getting the same academic support from their parents. Even with parental support, she had doubted her own preparedness for college:

I was absolutely convinced I would not be academically prepared or able to succeed... I just thought, coming from my little, podunk high school... that the other students would be much further ahead, and I will say probably freshman year, it did matter. Like I took... intro to biology class or whatever, and there were a lot of students for whom this was, you know, rehash of classes they had in high school. For me, it was all new, and I was so eager to just drink it all in, but by the end of freshman year, it was a level playing field, yeah. It was all good, and I did fine, but I wasn't sure that was going to be the case. – Urban, #5

Her experience as a freshman, having perceived that courses were a "rehash" for other students but not for her, could be why as an adult she expressed doubt about smaller towns' educational resources. Another rural-urban mover described his hometown's lack of emphasis on education:

So there was a lot of kids getting into trouble, a lot of drinking, a lot of substance abuse. Not a lot of scholarly activity. I did not grow up in the helicopter parent, suburban school like my kids go to... [I]t was really rare for the parents to ever ask to see a kid's report card where I grew up... [S]chool was not a priority. Uh, hunting was the priority. Getting home so you could help your dad on the farm was a priority... [S]chool was not a priority for the majority of kids. – Urban, #17

Similarly to the rural surgeons, the importance of schools seemed less about the number of K-12 schools and not even about the quality of the education itself but more about overall community support for children and education. The role of the adults throughout the community was more significant to both rural and urban surgeons than the role of specific educators. Also, similarly to

rural surgeons, urban surgeons decided on an urban practice first, and then they made decisions about their children's education, namely, in what school district to live. One surgeon said in his previous practice location (which was also urban), he and his family lived in an area with "great public schools" (Urban, #18). When asked if schools were a factor in his family's move to their current urban location, he said, "Both [previous city] and [current city], absolutely. Top priority for where we were gonna have a residence" (Urban, #18). He and his family had already decided on the city, then their decision about what part of town they would live in was driven by schools.

For urban surgeons, the topics of restaurants, retail establishments, and cultural events came up more often than among rural surgeons. They, too, discussed such amenities in terms of access, choice, and relative importance. Generally speaking, urban surgeons considered access to amenities like food, retail, and events to be a combination of proximity and the time it took them to get there. In contrast to rural surgeons, who dismissed travel time and distance as relatively inconsequential, urban surgeons did perceive that as travel time and distance grew, their access diminished. They acknowledged that public transit potentially increased access by cutting down on travel time and, perhaps, hassles like parking. For example, one urban surgeon saw public transit as an amenity in and of itself, because of how easy it made her commute:

I walk two blocks from my house, I get on the light rail, and I'm here, [...] versus, you know, my parking garage, which is twice again as far [...]. So, those things, surprisingly matter, whereas, yeah, I know people who have, you know, hour-long commutes and stuff. Couldn't do it. Couldn't do it. [...] It's like a 7-minute train ride from my house. It's awesome. – Urban, #5

Urban surgeons were also more likely than rural to discuss choice and a wider variety of amenities. For example, one urban-urban stayer in a county with an RUCC of 3 said:

We've got a fantastic zoo. It's ranked one or two. It and San Diego kind of vie for the top-rated zoo in the country... And we, you know, there's a nice children's museum, there's a nice... very active um, performing arts guilds here in town. We get a lot of off-Broadway shows, traveling Broadway shows that come out. ...

[T]here's a symphony here. I mean, there's all kinds of stuff to do... it's a great, great place to be. – Urban, #1

For this surgeon, the wide variety of activities definitely factored into him evaluating his city as a “great place to be.”

Urban surgeons were less likely to use company and brand names as a way to measure where on the rural-urban continuum a place was, but some of them who had had experiences in rural areas did. For example, one urban surgeon perceived her hometown as more rural, even though it was located in an urban county. She said that the coming of Starbucks to her town signaled its urbanization. She also described her time in residency, which occurred in a rural area, making her unique in this qualitative sample:

[T]he closest actual big store was a Wal-Mart 35 minutes away... if I wanted to go to Target, which I prefer, it's an hour and 10 minutes away. So, I just became a very efficient online shopper. So, but you know, that bothers some people. And I'm like, I don't need to go to the mall. You know? ... I don't need a big movie theater. I'm okay with the one 25 minutes away that has maybe 4, like, that's okay. Like, I go to a movie once every 6 months. Like, this is not gonna make or break this for me. But, there's really nothing, nothing to do [in residency town]. – Urban, #31

While this surgeon ultimately chose an urban practice location, her attitude toward amenities more closely resembles that presented by rural surgeons. This shows the importance of digging deeper into surgeons' choices to move back and forth between more urban and more rural places. For most urban surgeons in this sample, having a variety of amenities within a reasonable distance and travel time was more important than for rural surgeons, but attitudes varied based on the surgeons' range of experiences in different kinds of locations.

Much like their attitude toward traffic, urban surgeons seemed to accept the presence of crime, and their strategy to deal with it was to avoid areas where it was prevalent. Although

attitudes toward trauma varied, in general urban surgeons' trauma training did not seem to have left the same negative impressions on them as on rural surgeons. For example:

I think... there's more per capita firearm violence [in residency location] ... I think... they're usually somewhere in the top 10 for firearm violence. And so, I saw a lot of shootings, I saw a lot of stabbings, I saw a lot of operative trauma, and that was really exciting. – Urban, #2

For that urban surgeon, the trauma operations were exciting and did not deter him from urban living. Another urban surgeon was also not deterred by trauma and instead wanted it to be the central focus of his practice:

I wanted to work at a level I trauma center. I wanted to do trauma [yeah]. And teach surgery residents, and so for, to do that, that dictated the community that I needed to, to live in. I couldn't, I couldn't do what I wanted to do and live in Mason City, even though Mason City was a community that I really liked [yeah]. – Urban, #30

This urban surgeon still identifies as a general surgeon, but his desire to focus on trauma drove his practice location decision, and this is closely tied to findings about a health resources driving scope of practice. This urban surgeon actually chose to live in a rural community nearly an hour away from his practice location. This is similar to the choice made by the rural surgeon, quoted earlier, to live in a community where faith-based education was available but work in a community where he could practice rural surgery. Both urban and rural surgeons demonstrated they were capable of dividing their lives, if necessary, in order to simultaneously achieve the types of surgical practices and lifestyles they wanted.

Additional themes of note. While four global themes clearly emerged from the data – the use of space, commerce and the local economy, health resources and scope of practice, and amenities – there were several ways urban surgeons talked about rural areas that did not appear in rural surgeon interviews but are worth noting. A few urban surgeons characterized rural living as idyllic, meaning peaceful or picturesque.

I have thoughts that, from time of time, of owning, like, land and having a farm and this. [...] It sounds great! No, I mean, I don't know. Kind of like goats and cows and, you know, horses. I don't know- it sounds, sounds great. It sounds idyllic. – Urban, #25

This urban-urban stayer had not ever lived or worked in a rural area, yet he had the impression that a more rustic, land- and animal-oriented existence would somehow be nicer or more peaceful. Another urban surgeon who perceived she had grown up in a smaller town described her own upbringing as “idyllic” (Urban, #5). Although it was clear that rural surgeons were fond of their locations, they did not describe their communities in these terms. These are important examples of perception differing from reality that show how crucial it is to seek out data on lived experiences. Without such data, we cannot hope to understanding the realities of those who are different from us.

Also, some urban surgeons had experienced rural communities that they felt were less socially aware and less sophisticated. For example, one urban surgeon said “small-towny” meant “less access to culture” (Urban, #2). Although urban surgeons by no means associated this trait with all small towns, similar descriptors were not used by rural surgeons to describe small towns of any size.

Urban surgeons also talked more frequently than rural surgeons about the nature of being Midwestern. One urban-urban stayer compared the largest city in his home state with the city where he trained and said the two were “kind of not any different” from one another, and that the city where he trained was, “Kind of another big, Midwest town” (Urban, #27). One rural-urban mover who had previously practiced in a rural area said, “I think the city, Chicago, was full of Midwesterners, but they’re city people dying to still be Midwesterners” (Urban, #24). These comments suggest that a shared “Midwestern” social code or way of living applies at the regional level and supersedes some community-level characteristics for these urban surgeons.

The implication of this for practice location decisions is that for some surgeons, region may be more important than city or even more important than rural versus urban.

Discussion

While rural upbringing has been well-established as a factor in a physician's choice to practice in a rural area, the focus on upbringing causes a focus on the physicians' point of origin, rather than closely examining his or her experience of current practice location. This portion of the qualitative analysis sought to examine how currently-practicing rural surgeons, regardless of their upbringing, think about their communities and why various aspects of their communities were important as they chose their practice locations. Analyzing rural practice choice from this angle is supported by previous work that has shown an affinity for rural areas may come not only from a familiarity with such areas from childhood but experiences in rural areas during summer jobs, family trips, rural medical school rotations, or rotations during residency (Hancock et al., 2009). Instead of focusing on upbringing alone, it may be more productive to focus on how any exposure to rural areas has shaped how surgeons thought about rural communities during their practice location decision-making processes. Communities seeking to recruit surgeons cannot control a surgeon's upbringing, but they can work with medical educators and others in the workforce pipeline to influence what practice settings students and residents are exposed to during training.

One of the most important findings here is the emphasis both types of surgeons placed on their communities being on a continuum. Rural surgeons stressed that rural areas of the same population size may not share other characteristics, and similarly, urban surgeons said not all big cities share characteristics beyond population size. Rural surgeons in this sample expressed that rural areas vary in many ways from one another, somewhat in use of space, a great deal in their

health resources, and somewhat in their amenities. Urban surgeons were less detailed in their descriptions of how big cities are different from one another, but they were clear about how different neighborhoods within a city were different from one another. Where surgeons felt communities were on this continuum did factor into their practice location decisions for a number of reasons.

Previous research has examined how different aspects of community factored into physicians' practice location decisions, but the nature of surveys limited the depth of responses. The bulk of this work has focused on primary care physicians, but some has explored this topic in surgeons. For example, Heneghan et. al. completed a quite comprehensive survey that yielded important results about lifestyle preferences, scope of surgery, and range of community characteristics. One finding was that both urban and rural surgeons cared relatively equally about quality of life. Unfortunately, the survey was not able to tell us why or in what way quality of life was important (Heneghan et al., 2005).

Rural surgeons disliked crowding and traffic, and they preferred locations with more wide-open spaces rather than man-made green spaces and places with wildlife. Urban surgeons did not attach a negative value to crowding, though they did to traffic; however, some said their solution to traffic was simply to avoid it, which interestingly makes them similar to their rural colleagues who are also avoiding it but by not living near it at all. In terms of green space, its presence, and its use, the importance of outdoor activities, including hunting, to rural physicians has been noted in previous research. Jarman and colleagues noted that rural respondents were no more likely than urban to have an affinity for hunting, but they were more likely to express specific interest in hunting birds and large game (Jarman et al., 2009). Among the rural surgeons in this qualitative sample, hunting seemed to be less about the act of hunting and more about

being in nature and appreciating the natural landscape. This added an important dimension to discussions about the role the outdoors played in practice location decisions.

Rural and urban surgeons largely agreed on the states of rural and urban economies, recognizing that rural economies tended to be more reliant on one or two industries, whereas urban tended to be more diverse and therefore more resilient. Rural surgeons were more likely than their urban counterparts to observe and place importance on the outward manifestations of a healthy or unhealthy economy, such as quality of housing stock and infrastructure.

Rural areas tended to have fewer health resources, driving more generalist surgical practices, and rural surgeons were cognizant of the resources available to them as they decided which cases to operate on locally versus transfer to a higher level of care. Urban areas tended to have more health resources, driving a more competitive environment that tended to encourage more specialized practices. At the same time, urban surgeons tended to take the breadth of their resources for granted, trusting that no matter which cases they selected or were faced with in an emergency, they would have the appropriate resources available. When assessing a practice location, surgeons thought about the kind of practice they wanted to have, which included the variety and complexity of cases they would like to see, and they weighed whether the health resources they saw would support the type of practice they wanted. A study examining the United States as well as Australia found that the presence of a hospital, at minimum, was important in physician practice location selection (McGrail et al., 2017). An analysis by Langwell and colleagues found that counties that attracted younger physicians had more health resources, including more physicians overall (Langwell et al., 1987). Proving the inverse, Heneghan and colleagues found that rural surgeons were more likely to have insufficient clinical

resources and inadequate assistance compared to urban surgeons (Heneghan et al., 2005). These findings are all consistent with both the quantitative and qualitative findings of this dissertation.

Jarman and colleagues identified that, “Graduates in rural practice more often cited ‘broad scope of practice’ as an important reason for their decision” (Jarman et al., 2009). Also, Dr. Richard J. Field, Jr., wrote that rural surgery allows for, “a breadth of surgery not possible in an urban setting” (Field, 1995). Further supporting these findings, Valentine and colleagues found clear differences in volume and types of cases across isolated, small rural, large rural, and urban settings (Valentine et al., 2011). There is no question that rural surgery is different from urban surgery in its scope and volume, but what does remain in question is why this is appealing to some surgeons and not others. In addition, if it is appealing to more surgeons than just those in rural practice currently, why did that preference not trump other considerations as surgeons chose non-rural practice locations? Heneghan and colleagues get close to answering this question by finding that, “Urban surgeons rated income, sophistication of the medical communities and available facilities as more important than rural surgeons did as factors in selecting a practice location” (Heneghan et al., 2005). Because rurality, facilities and medical community, and scope of practice are so closely tied together, it is difficult to discern through quantitative or survey research which of these – or which interactions among these – truly drives practice location decisions. While the qualitative findings in this chapter are consistent with previous work in showing that health resources are, indeed, important to practice location decisions, they also make an important contribution about what kinds of resources are foremost in rural surgeons’ minds and why these are important to surgeons during practice locations.

For rural surgeons, community support for children and K-12 education was more important than the number or quality of the schools. Urban surgeons who had experienced rural

areas were more likely to doubt that rural areas supported education. However, it was clear that both kinds of surgeons made their urban versus rural practice location decisions first, and then they decided how to handle their children's education. For some rural surgeons, this meant practicing in one, more rural town, but living in another, larger town with access to faith-based schools. For some urban surgeons, the location and quality of schools governed in what part of the metropolitan area they decided to live. There has been little previous work linking physician practice location decisions specifically to K-12 education. Rebecca Diamond, in her examination of the relationship between how highly-educated a population is and amenities, did include a variable for public education. Her measures of education quality were per-pupil public spending and student-teacher ratios. She found that as the share of the population considered highly-educated increases, so too do measures of education quality improve (Diamond, 2016). While Diamond looked at highly-educated populations' choice of locations, researchers in Australia narrowed the field to rural health practitioners in a critical review of retention efforts. They formulated a conceptual model that states practitioners do consider amenities such as children's school options in retention decisions, which are close cousins of recruitment decisions (Humphreys et al., 2001). In the United States and in Scotland, there has also been research suggesting that children's education options are factors in physician location choices as well (Richards, Farmer, & Selvaraj, 2005; Ricketts, 2010).

When it came to crime, both rural and urban surgeons accepted and avoided it. Similarly to their approach to traffic and crowding, rural surgeons avoided urban crime by not living in urban areas in the first place; urban surgeons avoided it by living in areas of their cities that they knew to be safer. The surgeons also differed in the impressions their urban trauma training made on them. Urban surgeons were more likely to be unfazed or even interested in urban trauma,

whereas rural surgeons did not find those types of surgical operations appealing and allowed the kinds of trauma they saw in urban emergency departments to shape their overall impressions of the urban areas themselves. While those are the overall observations of the effects of urban trauma training, it should be noted that there were exceptions to these generalizations among both urban and rural surgeons.

The aforementioned quantitative study by Langwell et. al. included crime rates in its analyses. That study found that communities that attracted young physicians were more likely to have higher crime rates but gave the caveat that these communities were also usually larger, and larger communities tended to have higher crime rates. So, there was not necessarily a direct link between the physician's choice of location and crime itself. Those results are consistent with these qualitative findings. Both urban and rural surgeons accepted and avoided crime, just in different ways. Urban surgeons lived in areas of their city they perceived or knew to be safer, and rural surgeons chose not to live in large cities at all. The findings, though, that these surgeons' attitudes about crime and urban living could have been shaped by their trauma training during medical school and residency, is an important one. It shows surgeons reacted differently to that exposure to trauma. For some, it left an impression that urban living is synonymous with trauma and crime, whereas for others, it left an impression that trauma is just one aspect of urban surgery, and it does not define the entire city.

Rural surgeons tended not to attach a great deal of importance to access to or variety among amenities like restaurants, retail, and cultural events. However, when it came to access, they dismissed travel time and distance as fairly inconsequential, stating that if they were able to drive to an amenity within a reasonable amount of time, then they did, in fact, have access. Urban surgeons, on the other hand, were more likely to see greater travel times and distances as

inhibiting access to amenities. They also valued variety and choice among amenities more highly. Rural surgeons, as well as some urban surgeons who had had experience in rural areas, used the presence and number of amenities, and often specific brand names, to describe where various communities were in the rural-urban continuum. More rural communities tended to have fewer amenities, and the presence of Wal-Mart was often noted. Less rural communities tended to be described as having more amenities, and store names like Target or Starbucks were mentioned. The most urban communities tended to have the most amenities, and names like Macy's and other department stores were reserved for those areas.

Community amenities in relation to the rural workforce have been explored, though not in systematic or consistent ways. Although some researchers have narrowed their focus to surgeons and some even to general surgeons, the focus has disproportionately been on the surgeons' own characteristics and the features of their practices, such as volume, facilities, and scope, rather than amenities of the broader community. No study to date has analyzed the relationship between community amenities and rural general surgeons' practice location decisions using mixed methods with a greater emphasis on the qualitative analyses like this dissertation has.

All of the community characteristics that emerged in this analysis come together to form what surgeons think their lives will be like in a practice location. They consider how crowded, how hectic, how vibrant, and how supportive of children a place will be. They think about what resources will be available to them, what type of practice they will have, what kind of trauma they will see, and how safe the community is overall. They put all these pieces together as they are trying to decide on a practice location. The community characteristics outlined here in Chapter 5 will be discussed in Chapter 6 in terms of their deeper meanings to surgeons, which

will include how surgeons interact with and take into consideration the perspectives of other people.

Lessons learned from recruitment experiences

To close this chapter, I am including a brief analysis of the code “recruitment experiences.” This code captured specific statements made by the surgeons in the sample about their recruitment experiences, not only in their current locations but previous practice locations as well, if applicable. The lessons we can learn from these experiences begin to bridge the basic identification of community characteristics in this chapter and the meaning behind these characteristics which will be explored in the next chapter.

Based on their statements about being recruited, urban surgeons are more driven by the type of practice they want to have. While rural surgeons frequently expressed a desire to have a broad scope of practice, they were not very specific beyond that. Urban surgeons, on the other hand, knew whether they wanted to focus on a specific area of surgery – such as colorectal, breast, or trauma – sometimes in spite of not having fellowship training. They also tended to have opinions about what administrative, teaching, or research roles they might want to include in their professional lives even before starting practice. This issue of composition of practice will be further explored, in fact, in Chapter 6.

Not only did urban surgeons have specific conditions in mind for their practices, but they also tended to have been approached by their faculty for jobs more often and earlier in residency than the rural surgeons had been. The reason for that, though, is unclear. It is possible that these residents had already telegraphed to faculty that they wanted to stay in an urban area and perhaps at the academic medical center specifically. If residents had already indicated they wanted to go to a rural area, perhaps faculty did not approach them for that reason, and not for any reason

related to merit. It is also possible that faculty did not know anything about residents' practice location intentions and instead were approaching residents based on merit and in so doing, tipped some who might have gone on to rural practice to choosing urban.

Both urban and rural surgeons stressed that getting a job hinged on who you knew, including faculty, peers who are recent graduates, or other colleagues met through networking at conferences or educational rotations or courses. The data painted a clear picture of a very informal hiring system; however, rural surgeons did mention the use of recruiters, campus job placement services, and job boards, whereas urban surgeons did not. Urban surgeons also did not mention any over-arching initial preferences about urban versus rural practice, other than to correlate scope of practice with size of town, recognizing that broader scopes of practice tend to be more feasible in smaller towns, and specialization is the norm in more urban areas. For rural surgeons, two key areas emerged as particularly influential during the recruitment process: their predetermination of acceptable geographic areas and the critical role of the onsite visit. Some rural surgeons identified that they wanted to stay in or return to their home state, whereas others identified more broadly that they wanted to live in any rural area. In the hierarchy of geographic factors, for most surgeons in this study, rurality seemed to be more important than any specifically-identified rural town. Once an area was identified, surgeons solidified their decisions during the onsite visit, and for those who were married, it mattered to them how their spouses were treated on these visits.

Chapter 6: Why Community Characteristics Matter

Introduction

In this chapter, I delve into the meaning surgeons associated with these community characteristics. In other words, how and why do community characteristics matter for respondents? This builds on Chapter 5 by analyzing how respondents associate meaning with the identified community characteristics. These findings tie into the quantitative findings related to health resources presented in Chapter 4. They are also related to the surgeon-level findings related to birth location, training, and current practice presented in Chapter 3. Experiences in those first three points of time – upbringing, medical school, and residency – do play a part in how surgeons assign meaning to health resources and many other community characteristics. This interplay of quantitative and qualitative findings is discussed not only in relationship to the health services research literature, but also literature on behavioral economics. Humans do not always make decisions in our economic self-interest; instead, we rely heavily on our values, attitudes, and preferences (Ariely & Norton, 2007; Norton & Ariely, 2011; Samson, 2017). These qualitative findings demonstrate how values, attitudes, and preferences act as a filter for community characteristics. In many of the decisions made by the surgeons in this sample, we see behavioral economics concepts in action.

First, I will consider how surgeons attach meaning to their environment. Then, I will describe how they attach meaning to the ways place impacts their scope of practice and professional role as a surgeon. Finally, I will explore how community amenities are meaningful because of their importance for family member quality of life, with an emphasis on the role of spouses. As in Chapter 5, the perspectives of rural surgeons are presented first, as rural practice

is the main outcome of interest, and then the perspectives of urban surgeons are presented for comparison.

Findings

Finding meaning in one's environment: perspective of rural surgeons.

The characteristics of rural places that surgeons described in Chapter 5 were important in practice-location decisions because of their deeper meanings. I have grouped these meanings into two domains: people and place. First, I will discuss people: the social fabric of a place and what it means to surgeons. Then, I will discuss place more literally: the meaning behind the more tangible characteristics identified, like wide open spaces, green space, wildlife, housing, and infrastructure.

People: The social fabric. Rural surgeons asserted that the smaller a place was, the more interconnected its people were. Other researchers have described the social fabric of rural places versus urban places using the image of a blanket (Freudenburg, 1986). Rural places are described as a knit blanket, where the social aspects of life are interwoven strands, tightly knit and constantly overlapping. In one surgeon's words, "it's such a small town, and everybody knows everybody" (Rural, #15). Urban places, on the other hand, tend to be more like a patchwork quilt, with different parts of one's social life connected on the edges but not overlapping. Both blankets give warmth, or a sense of community, but they offer different types of warmth and therefore different experiences of community. The rural surgeons in this qualitative sample described the social fabric of their rural communities as having a high level of interconnectedness. They described a general willingness of rural people to each help each other, a lack of anonymity, a mixing of socio-economic strata, a "personal" feeling in practice and in the community in general, long-lasting relationships, and relationships with entire families.

One benefit of interconnectedness highlighted by many rural surgeons was community members were often willing to help each other. A rural surgeon who practiced in his hometown described it this way:

[T]hey [community members] know when you die, and they care when you're sick in a small town... I think that's highly unique, and... we're all kind of in it together. [...] I see that with folks who've become ill... you can come back home and, and people take care of 'em... because of a pre-existing relationship.
– Rural, Pilot #1

Not only did he think small towns were interconnected, but he said he had observed the caring nature of a community built on “pre-existing” relationships. One rural-rural stayer said that whenever her patients needed a ride to appointments, they always seemed to be able to find someone who could help them, and it was not always a family member. The impact of “people look[ing] out for one another” (Rural, Pilot #1) extended beyond their patient panel to their own lives. For example, one surgeon who lived alone had a neighbor who frequently would help her when she got called into the hospital. In one instance this surgeon recalled:

[Neighbor] was a lovely lady... she'd have a key to my door so that she could finish whatever I was in the middle of, so that I could have company... [T]he biggest one was I was hosting the clinic Christmas party. I got called in to take an appendix out... so like, [neighbor], “Could you come over and put the, you know, turn on... the electric oven for the baked potatoes, and put the chicken in at a certain time?” – Rural, Pilot #2

She did say that if she had been married, perhaps a spouse could have helped in these ways instead of a neighbor, but she closed this story by saying, “I always kinda blamed singleness, and well no, not necessarily. Perhaps good neighbors are just in need no matter what” (Rural, Pilot #2).

Another surgeon said she was deathly allergic to poison ivy and so relied on others to do her yardwork. Although they were paid for this work, the surgeon considered them friends, too, and if they ever needed medical advice or a family member needed a clinic appointment

urgently, she did her best to help them. Rural surgeons perceived or had experienced firsthand that smaller communities, overall, were more interdependent than larger towns.

Rural surgeons also reported that a potential downside of interconnectedness was a lack of anonymity. One surgeon who grew up in the same town where he was practicing said he felt like he could not make mistakes as a kid: “You do somethin’ stupid, somebody’s gonna see it... you can’t get lost in the crowd” (Rural, #10). One surgeon who got married after establishing her practice in her current, rural location, said the interconnectedness was heartwarming but somewhat overwhelming during wedding planning. She said, “We had... to really limit our guest list... because everybody’s our friend here” (Rural, #16). Knowing everyone in small community also came with frequent interactional obligations, which could sometimes feel exhausting:

[I]f you go to a rural area, practice your wave... It’s sorta like if you don’t wave at everybody that waves at you on the mile to work, you’re rude, okay? Stuff like that. Stupid stuff like that, you know? – Rural, Pilot #2

She went on to say people take it personally when you do not observe social niceties like waving, saying hello, or asking someone how they are doing. Another rural surgeon echoed this sentiment, saying he had gotten ‘called out’ on social media for not saying hello to a patient at church (Rural, Pilot #1). He also reported, though, that this negativity was mitigated by the social fabric:

[T]he good thing in a small town is she has no credibility because everybody knows her, everybody knows me. Versus like in a city, you see whether it’s Angie’s List or whether it’s Facebook or whatever, you don’t know if these people are crazy or if they’re legitimate, ’cause usually just the outliers are gonna report you, the really happy or the really ticked off. – Rural, Pilot #1

That surgeon had experienced both the upside and downside of interconnectedness. Some rural surgeons enjoyed the lack of anonymity. As one urban-rural mover put it, there is “this weird, distorted celebrity” phenomenon that comes with being the only surgeon or one of few surgeons

in town. Since he was from an urban area, this took some getting used to:

I don't know who other people are, but they know I'm Dr. [last name] ... it's like, "Hi, I don't know you, but hey," you know? And I have to catch myself to make sure I'm not doin' the, the [big city] thing, or inner-city thing, like, "Why are you talking to me?" It's like, "Oh, right, hi, how're you doing?" – Rural, #12

Although that urban-rural mover was still adjusting to the more tightly-woven social fabric of a small town, one rural-rural stayer who had been in practice longer took pride in being recognized as the town surgeon and suggested that other long-term residents also find pride in being recognized for their roles in the community.

I think a satisfaction in, when you work hard, you've reached a level of education, of being somewhat recognized... you know, there's the donut shop owner. There's only one donut shop, and everybody knows her... she's famous in town. [...] The one... guy who has the gas station on the north side of town who's still gives full services... Man, everybody knows, you know? And I think there's a lot of, a lot of personal fulfillment in that. I think... So, the same with: you're the surgeon. – Rural, Pilot #1

One urban-rural mover described how he thinks his town takes pride in having “the” surgeon take part in community events:

On Friday evenings, didn't matter if you had kids at school. You take your little kids to the Friday night football game. And people socialize, and they like seeing you there. – Rural, #11

This rural surgeon was not the only one to highlight Friday night football, other local sporting events, and community festivals as key events which prominent community members, such as surgeons, were expected to attend. In contrast, though, two other rural surgeons said they appreciated being treated like regular people, around town and in practice. One rural-rural stayer said:

Most of them [community members] are super nice, just good country people that still see you as a person, not just a doctor. Um, not just something they need or want done. – Rural, #15

She appreciated not being treated as a commodity or a means to an end, but a person who was worthwhile beyond just her professional training. One urban-rural mover experienced something similar; she felt her patients were looking out for her, treating her like a regular person. She had laryngitis the day I spoke with her, and she said, “When I was seeing my patients this morning, they said, ‘Doc, you need to take care of yourself’” (Rural, #16). This dynamic clearly meant a lot to her, and she followed up on this sentiment later by saying, “I live with my patients, and they take care of me, too” (Rural, #16).

Another facet of “everybody knows everybody,” was rural surgeons perceived that different socioeconomic strata mix more in rural areas, whereas they had observed these groups tended to remain stratified in more urban areas. One rural-rural stayer said:

[G]rowing up in rural... there’s no segregation. You are – by definition, 99 percent of people going to a public school, um – oftentimes very aware of where every kid lives and what home environment they have... you hear those stories daily, and so, you’re... I think much more in tune with the entire human condition in a rural area. – Rural, Pilot #1

As an adult reflecting on his experience in a rural community, he realized that being integrated with those from different backgrounds had helped him develop empathy.

One rural-rural stayer made it clear that while some may experience the mixing of socioeconomic strata as positive, for some it is a negative experience. Sometimes the “hierarchies” of rural areas can be painful. One rural-rural stayer talked about growing up on a farm, attending school in town, and facing skepticism about her pursuit of higher education based on others’ perceptions of her lower social status:

I mean, there’s hierarchies in all these small towns. I was a farm kid, you know. I was on the lowest spot, you know, whatever. I had kids... said, “You smelled,” or whatever. We probably did [smell]. We had chores to do, but anyway... so as I was working... you know, in the drive-in and whatever [people said], “Oh what’re you going to school for?” “I want to go to med school.” “Oh you, no, no,

you won't, you're not—" Can you believe that? But then I pushed hard, and top of my class. I was fiercely ambitious. – Rural, #21

The community expressed disbelief that someone who came from the “lowest spot” could rise and become a medical doctor, and that had been hurtful to this surgeon. While the previously-quoted rural surgeon saw a benefit to his children mixing with those from different backgrounds, this rural surgeon had experienced judgment and condescension.

Another facet of interconnectedness rural surgeons described was the longevity of relationships they tended to experience in small towns. Although rural areas – and small towns – do experience out-migration, these surgeons had experienced that those who remain were typically long-term residents. Rural surgeons also discussed that in smaller areas, relationships were formed not only with individuals but with entire families, and they enjoyed that interconnectedness or thought it was beneficial in some way. One surgeon said this phenomenon was beneficial as he was being recruited back to his hometown, when he left his previous, urban practice location:

[P]eople had a, an immediate um, you know, good impression of me because, [...] as we put it around here, not only do I know you, but I know your people, right? They knew my people, and they knew me, and so, they were thrilled with the idea that a local boy would wanna come back and, uh, practice surgery. – Rural, #6

This surgeon's family had been a part of the community for decades, and in his mind, that longevity caused those who recruited him back home to feel like they knew him, too, in spite of the fact that he had been away for nearly 20 years. One urban-rural mover had practiced in different urban and rural locations throughout his career, and at the end of his career, when I spoke with him, he had returned to a rural town where he had practiced previously. He liked that even after having been away, people remembered him. He said:

Actually, it's been 18 years, but... when I came back, there were people... they came in 'cause they knew I was back, and they knew me. I had a name from when I was there [before] ... [S]o, I enjoy the [town name] thing. – Rural, #22

Some rural surgeons highlighted these communities' long memories as both a pro and a con of rural living. This will be discussed further under the nature of rural surgery, as will another phenomenon resulting from longevity of relationships: non-family members being treated like family.

While overall rural surgeons described benefits of the tightly-knit social fabric of small towns, some did mention the potential to feel like an “outsider” in a small town. This feeling was described distinctly as negative. One rural-rural stayer was practicing in a different rural town from where she grew up. Although she practiced there for 16 years, she never felt like an insider:

You [sic] never totally one of them, because, uh, you didn't grow up there. You didn't have the right name... and I spent 16 years... and by golly, I knew a lot of those families and knew how everybody was related... and maybe who lived at that place before the other people did, and knew what it was called, the nicknames for the roads and that kinda stuff, but... all of my friends had moved in at some point. And [we] were never one of them. – Rural, Pilot #2

While she had been dedicated to taking care of the community for a long time, her perception was that it was never enough to make her equal to someone born and raised in that town.

Another rural-rural stayer, who was practicing in the same town where he grew up, recognized that his wife – who was from out of state – was concerned about feeling accepted in his hometown. He said, “I’m sure she felt way much [sic] like an outsider” (Rural, #10). He had been confident she would adapt to small-town life, and she did, though not without emotional difficulty and strain on their marriage.

Place: The meaning behind more tangible characteristics

For some rural surgeons, having more space carried deeper meaning than simply being in a less crowded place. They saw wide open spaces as symbolic of values such as freedom,

independence, and privacy. To them, being away from larger communities meant they were more free to live and practice as they saw fit. One surgeon who self-identified as a rural-rural stayer talked about growing up amidst open spaces and described what he thought the attraction of that was for some people:

[M]y closet neighbor's 2 miles away... And I like to be out in my yard and nobody's around, you know. Corn and beans, you know, that's it. And I like that... I think everybody likes to be somewhere where they're not feeling too crowded. I think that's the great appeal with these small-town people. They like farming communities, they grew up out here, and they like the wide open spaces and the freedom of it, and not feeling like they got neighbors breathing down their neck.
– Rural, #8

It is interesting this surgeon asserted that “everybody” wants to be in a place that is less “crowded.” For some rural surgeons, literally having more space and isolation meant gaining an ability to focus on their priorities – whether those were further education, family, or their surgical practice – with fewer distractions.

Another rural-rural stayer, who had previously lived and practiced in a very large urban area, talked about the importance of getting back in touch with his agricultural roots. He did not have a desire to farm, as his father and grandfather had, but he wanted to be closer to nature. He described a special linkage between the land and people with an agricultural background:

I wanted to live somewhere where there was grass and trees. Doesn't seem like asking a lot, does it? Grass and trees. After 9 years on concrete, grass and trees are important to you, and the first thing I did was plant flowers. Farmers have a, uh, connection, this organic connection to the soil, right? I mean, the smell of soil. – Rural, #6

As he spoke, he motioned with his hands as if he were digging in the soil and then holding up handfuls of dirt, reinforcing his point.

Along with open space and the land itself, rural surgeons also discussed why green space and the presence of wildlife mattered to them. One urban-rural mover talked about the contrast

between where he grew up and where he lives now and how much he enjoys seeing the natural landscape and the animals that live in it:

Out here, seen deer out my back door. I've seen red-tailed hawks, they're gorgeous. Um, there's a field mouse that likes to set up a nest in my tractor... seen eagles. Seen turkey vultures... some of the biggest groundhogs, beaver... you walk in the woods up by streams, there's actually fish in the streams. You didn't see that in [big city]. [...] My mother-in-law loved hummingbirds. So, you'd go to her back porch, and just watch the hummingbirds feast. I don't remember that in the city... There's buffalo if you drive towards [another town]... I never saw buffalo, you know? [...] [A]nd... when it's blanketed in snow. When there's a summer thunderstorm. You see double rainbows. I don't remember seeing double rainbows in the city. Um, the stars. There's more stars in the country.
– Rural, #11

Each time he named something that you “didn’t see” in the big city, his intonation went up, and his eyes would widen, conveying his wonder and admiration for his rural life and location.

Another urban-rural mover explained how he came to appreciate the natural landscape and animals found in more rural areas. For him, it began during medical school, when he and his wife found housing that featured more green space than places he and they had lived previously:

[W]e found a, a nicer apartment... [...] In the back of it... there were these two lakes, and there was like a little trail that kinda went, went around it. And so, I've always liked the outdoors, and so, that's I think where the transition from being inner-city and wanting to be 'in the midst of it' started to shift, where, now I like the peace and quiet, where, I can go and kinda clear my head... and so I think that's where the shift of me leaving that hustle and bustle and, and wanting to be in the midst of all that, it went away. 'Cause I would rather spend my Friday night... I'd just go hang out out back, sit down, and watch the turtles and wildlife.
– Rural, #12

This surgeon found the “peace and quiet” offered by the outdoors appealing and saw it as a clear contrast to what he calls the “hustle and bustle” of the urban core. This same desire to have a place to clear one’s head and relax is reflected in many of the rural surgeons’ statements about their homes.

In chapter 5, I established that for rural surgeons, the outward manifestations of a healthy or unhealthy economy tend to matter more than the economy itself. Some of the more visible manifestations included housing stock and community infrastructure. Housing stock mattered to rural surgeons because they were looking homes, and there were some commonalities across what made houses homes. For some, a house became a home when it was a place for family to congregate, where they could pursue hobbies, or to get away from work and relax. One rural-rural stayer who wanted his house to be a gathering place said:

And um, part of growing up for me is... everybody in high school came to my house to party... We had a pool table, my parents had an open-door policy... And so that's what I wanted my kids to have... be comfortable bringin' their friends, and so, the pool came with the house. I would not have built one, but we had a pool a big yard, it's a very open, so we've had 20, 30 kids stay overnight, sleep on the couch. So that was a big part of why I wanted that kind of a, that kind of a house so that the kids would be comfortable bringin' their friends. – Rural, #13

For this surgeon, his choice of house was not about having a big or “nice” house for its own sake or as a status symbol. The house only had meaning because it was a gathering place; the social aspect was very important to this surgeon.

Another rural surgeon talked about having customized his home so that he could work on his chosen hobby whenever he wanted:

I went home [after work] and on the 10 acres I built... another 2-car garage and a huge woodshop, and that has always been my hobby, and I could spend hours and all night in my woodshop. – Rural, #22

Again, having an extra garage or more space was not about status but about making his house into his home, where he could do as he pleased. One urban-rural mover talked about spending time on his property saying, “I’ve landscaped... just to kinda make it ours” (Rural, #12). He went on to explain why yardwork and this process of making their house a home mattered:

If I have a bad day at the hospital here, and I'm not on call, 'cause just being on call puts me in a cranky mood anyway, um, I can go home, go for my run, and

that's it. The day is over. I'm at home, I'm at my sanctuary, which I like, I love. I've got any number of tasks that I can do to clear my head, you know.
– Rural, #12

The house and property itself, along with the tasks in and around them, served as a “sanctuary,” providing a respite from a busy, sometimes stressful professional life. Another surgeon who perceived himself as being in rural practice talked about how much he enjoys spending time at home:

Bein' outdoors... I turn the grill on and cook a steak and sit outside and take stuff out of the garden and eat that with the steak, with a beer or some wine, and turn some music on, and sit... I often think to myself, honestly, I would really not rather be anywhere right now. – Rural, #10

For him, being outside on his own property, eating food he grew himself, was his chosen way to decompress. All of the rural surgeons talked about their homes as means to ends. They existed to create a gathering place or to allow them to relax, clear their minds through chores or hobbies, or decompress.

Just as housing was a means to an end, so too was community infrastructure. Community investment in buildings and resources like schools, sports venues, and fitness centers meant more to rural surgeons than their functions. They symbolized how well the community was doing and were sign it could support the kinds of practices and lives surgeons wanted. One rural-rural stayer talked about the interconnectedness of these various pieces of infrastructure:

There's synergy in having an appealing place to work, having a business mindset that is going to appeal to a young person coming out... and then a hospital where they, where they're being rewarded in other ways, financially, and they feel they can safely take a patient... [T]he town right before the recession in '08, passed a school bond issue, and a new high school, new grade school, and invested in the junior high before that. So, 10 years ago, a brand-new football stadium. And then, the hospital board again having big vision... we have a brand-new OB wing, sparkly, and we'll move into new ORs in three months... [T]here's a lot of synergy. It's a thriving place and a lot of forward-thinking folks. – Rural, Pilot #1

It was important to him to locate in a place that showed it was moving forward by investing in

itself. At the point in his life when he chose this community, he, too, was looking to move forward. The quality of his community's hospital and schools and the investment in community infrastructure conveyed, to him, that the town was a place that would grow and progress, just as he hoped to do in his professional and personal lives.

Finding meaning in one's environment: for comparison, its meaning for urban surgeons

Social fabric (urban surgeons)

Urban surgeons had similar observations about smaller and larger communities that rural surgeons did. Those who had experience living in rural communities, cited many of the same manifestations of interconnectedness, even saying the same phrase, "everybody knows everybody." One surgeon had completed rural rotations during medical school and said:

[W]ell, it's just more friendly, you know. Obviously, it can also be detrimental because everybody's in everybody's business, everybody knows everything about everything. [...] And when I rotated with an internist in [small town] ... over lunch I would get together with him and several of the guys that he grew up with... and they would get together every day at the Holiday Inn for lunch... And just to sit and talk to these guys.. just that community, that, that small-town life, was just awesome. Absolutely awesome. I grew up in a small-sized city, but... there were way more people that I didn't know than I did. And it was exactly the opposite in [a] little town... I liked the idea of having these guys that've been best friends, you know, since they were walking... that was very cool. – Urban, #1

After his rural rotation, he said he got encouraging feedback from many community members.

He said, "Several of the people that I met... said, 'Hey, if you're coming back, I'd be happy to doctor with you.' [...] 'If you're coming back, let me know.' Like, wow. That's really cool"

(Urban, #1). He was impressed not only by the long-standing relationships and

interconnectedness of a small place, but he was also moved by people saying they would trust

him with their medical care if he were to come back there and practice. He did, in fact, look into rural practice, but he acknowledged that interconnectedness had downside: a lack of anonymity.

His wife was originally from a rural area, and she had experienced this firsthand and did not

want to return to that dynamic. He said, “She had experienced that everybody knows everybody, and everybody knows everything about everything that everybody’s doing, and so that wasn’t as appealing” (Urban, #1). Although they settled in an urban area, their county has an RUCC of 3, which is the least urban classification; the next-smallest classification (RUCC = 4) is considered rural in this analysis.

A few urban surgeons even felt that where they lived was like a “big small town.” Some of them perceived that although their cities were definitely cities and not rural areas, they did not use the word urban and said their community still retained some of the social fabric more closely associated with smaller towns. One urban-urban stayer said:

[Other doctors]’re often your neighbors, and so you see them all the time. And your kids are certainly going to school with ’em or playing ball with them... yeah. It’s, it’s a, again it’s a small, it’s a big small town, that’s a very small town.
– Urban, #27

Notably, he said that his fellow physicians were often his neighbors and existed in both his professional and personal spheres. He did not mention patients. Although several urban surgeons noted a degree of interconnectedness in their cities, none of them drew connections between these relationships and people’s willingness to help each other or look out for one another. Some, who did not think their cities were particularly interconnected, even went so far as to say urbanites can be self-centered, in a hurry, and in their own worlds.

So, we had family in both of those places [city] and [city], and so we would go back to visit, and I just, I really, I didn’t like the traffic, I didn’t like the way that everybody was in a hurry. Nobody cared a bit about anybody else, everybody was just into themselves [...] it was just very unpleasant to be there. – Urban, #1

This particular urban surgeon was located in a county with an RUCC of 3, putting him in a position to compare a slightly smaller and less dense urban area with larger, more dense areas. Urban surgeons’ perspectives overall about the social fabric of communities reinforce that there

is not a clean divide between urban and rural but instead they are on a continuum from more urban to more rural, and many factors determine where a community is on that continuum.

Place: The meaning behind more tangible characteristics (urban surgeons)

Several urban surgeons shared rural surgeons' affinities for green space and wildlife, though they were mentioned less often and usually in less detail. Those urban surgeons who discussed these topics the most tended to be those who had had experiences living in rural areas previously. This in and of itself is evidence of the effects of previous exposure to rural environments and the importance of looking more holistically at surgeons' various locations across their lives. One rural-urban mover who previously practiced in a rural area had retained his appreciation for green space and being out in nature. He talked about enjoying hunting, but he made it clear that the act of hunting was far less important than nature itself:

And you watch squirrels, and you watch rabbits, and then you watch geese land, and then you watch deer come by, and the deer have no clue you're there... [I]t's just, doesn't matter if I even get around to shooting, 'cause to me that's just total peace. I get to pray. I get to think about patients, you know? There's patients that are givin' me a hard time I'm wondering about, and I can sit up there and think, uninterrupted, 'cause I don't bring my phone with me. I do nothing. Just sitting there, for hours. – Urban, #24

He mentioned being able to think, pray and find peace. He seeks this solitude now, as an urban surgeon, just as he did when he was in rural practice. Another urban surgeon who perceived her hometown as rural and completed residency in a rural location, talked about running outside being important to her.

You're gonna think I'm crazy when I tell you that I live in downtown [city] in a high-rise condo. Um, and I, uh, spend lots of time running along the river, along the Mississippi River. – Urban, #31

She had previously said she enjoyed rural areas, and she recognized that telling me she lived in a high-rise would seem contradictory, hence her remark, “you’re gonna think I’m crazy.” Running, though, allowed her to maintain a connection to the outdoors and more open spaces.

The meaning of green space for rural and urban surgeons returns us to the complexity of surgeons’ chronologies. Calling someone a rural or urban surgeon masks their previous experiences along the rural-urban continuum, growing up, in training, and in any previous practice locations. How they feel about green space is dependent on all of these collective experiences, and it would be unfair to say that one or the other ‘type’ of surgeon is the only type that wants to feel a connection with the outdoors.

Urban surgeons had many of the same feelings about their homes – and what made their house a home – as did rural surgeons. Homes were places to clear their heads, relax, and pursue hobbies, though urban surgeons did not bring this up nearly as much as rural surgeons did.

Regarding the role of the economy, urban surgeons seemed to take stability of urban economies and their diversity largely for granted. One surgeon who had also brought up the “big small town” phenomenon was in a city that could be considered part of the Rust Belt. He discussed what companies had come and gone from the city and what effects those movements had had on the local labor force. He did not, however, connect those economic conditions to his professional or personal lives. It seemed more like these things were happening around him but not to him. This was a stark contrast to the rural surgeons who seemed much more in tune with their communities’ economic well-being through their observations of its outward manifestations.

Urban surgeons, like their rural colleagues, noted the insider versus outsider phenomenon but said it could be present in urban and rural areas both. One urban surgeon who had done a

rural rotation in medical school and done locum tenens work in a small town talked drew a connection between being born elsewhere and being an outsider in a small town:

[A] town that size is kind of insular, meaning that if you didn't grow up there, it takes a long time to get to know people... And think, unless you grow up in that town, there's nothing to do in the evenings, you know, if you grew up in that town, yeah, you have all your old friends, you have your family [mm hmm], you know, you have your, your parents there to watch kids [mm hmm], you know all those sorts of things, but, and again, I, I felt like I needed to be someplace a little bit bigger than that. – Urban, #2

His experience was that in small towns, family and long-standing relationships formed the core of one's social life. He used the word 'insular,' implying that if you did not have family and long-standing relationships, you would be on the outside rather than the inside of small-town society. Another urban surgeon, who perceived she had grown up in a fairly small town, felt like an outsider in her current, urban environment. She said:

I really enjoy the people here, and I like sort of the friendliness of people, but... there's the feeling that, that there's the people who are the locals, the people who were born and raised here, and then there's all of us who weren't born and raised here. [...] Here... the first question people ask is where did you go to high school, and they mean high school in [city]. And by the answer you give, they know... what your socioeconomic status was when you were in high school, know what your religion was... So, it's a... sort of classist community. – Urban, #5

Although she had felt welcome and, as she also said, “found a community” in her current city, she did not feel like she truly fit in because she was not originally from there. In these remarks, she also pointed out characteristics she felt people used to separate “us” from “them” beyond simply where they were born, such as socioeconomic status and religion.

The nature of rural surgery: the perspective of rural surgeons

Resources play a critical role in surgical practice, as rural surgeons repeatedly pointed out. Resources drove their scopes of practice; this resulting scope and the meaning the rural surgeons associate with it combine to help shape their role in their communities, not only as

surgeons but as people. It is this transformation, from resources to scope to role that takes us from the discussion of resources and scope in Chapter 5 to the deeper discussion of “the nature of rural surgery” here in Chapter 6. I will present several themes that emerged that demonstrate how meaning and resources combine to form the nature of rural surgery: 1) building a rural surgical practice is reliant on time, trust, and word of mouth, 2) resources are at the heart of clinical judgments regarding patient transfers, 3) expanding one’s scope of practice means serving the community to a greater degree, and 4) partners are resources as well as mentors, affecting workload and lifestyle. At the core of rural surgery is this fact: patients are not only patients but also friends and neighbors. While this chapter introduces this overlapping of roles, it will be investigated in Chapter 7 as the central tenet of rural surgeons’ experiential place integration.

Building a rural surgical practice

The way rural surgeons established and built their practices varied by size of town and size of practice, again reinforcing the importance of the rural-urban continuum. Some rural surgeons were hired to take the place of a retiring surgeon, so they essentially walked into an established practice and adopted the previous surgeon’s caseload. In those situations, their scopes of practice were largely predetermined based on the community’s resources. The new surgeon, though, usually augmented that pre-established scope of practice with additional technical advances acquired during their training. Other rural surgeons started solo practices or joined practices that were not yet well-established. In those situations, they needed to establish both a referral base from other physicians – usually primary care physicians – and referrals by word of mouth among community members. How long this took often was related to the size of the town and its interconnectedness. For example:

In a smaller community, bad news travels much faster than good news... So, I just kept plugging away doing the best I can for my patients, and you know, your practice builds not only by your referrals but also by word of mouth. And I think the word of mouth, like I said, just took some time to get out there. I felt, in my feeling, it took 7 years to, to get to the point where I felt I had some name recognition in, in [town] ... you start seeing some repeat customers, I guess I call 'em. Or, or family of somebody you've operated on, you know. – Rural #19

This surgeon was located in a county with an RUCC of 7. So, while the community was small and most everyone likely knew who he was, the 'name recognition' he referred to here was tied to his surgical outcomes. It took time for his good reputation to build, but it eventually did and became the foundation for the community's trust in him. With that trust came word-of-mouth referrals. Another surgeon made this same connection between building a practice and the interconnected nature of his rural community.

I think the longer that you're here, then, the people in the community, you learn that word spreads around very quickly, too. Of, who you are and if you treat them well, then, everyone goes back to their church or the community in groups, and they all talk, so you, you learn that you just kinda have to take care of everyone like they're family, 'cause word gets around very quickly. – Rural, #14

Rural surgeons emphasized that bad news tends to travel faster than good, and when a bad outcome occurs, people – the community as whole – tend to have long memories. Thus, this tight knit social fabric can be beneficial as a surgeon is building a practice. However, it also creates great pressure to be consistently excellent since even one bad outcome can have an out-sized effect on a rural surgeon's reputation. Another rural surgeon said precisely this, that if there were a bad outcome, it could be a major setback, perhaps more so than in an urban area.

You have to build confidence in the community, too. [...] [O]ne or two bad outcomes in a small town can set you back. Everybody has a bad outcome now and then, so, so you have to get enough experience with good outcomes and... get to know enough people in the community to really build their confidence... that does take a while, I think... I don't know exactly how long that takes really, but it does take some time. Years, probably. – Rural, Pilot #4

Building a practice was not only contingent on referrals, rural surgeons said. They discussed that

some communities are more equipped than others to provide surgical services. Some are willing and able to acquire more resources, and some are not. One rural surgeon explained how more resources were required when she first moved to both for her current and previous rural practice locations:

*I brought more volume, so we had to hire. When I came on, we hired two more nurses and two more techs just from the volume. Um, but same, same happened when I moved down here... [Current partner] went through the headaches of developing [the practice], but then we had to kind of double it by the time I came.
– Rural, Pilot #3*

She went on to say that in a rural area, the quantity of resources is important, but so is the quality; for example, staff may need additional training. As she talked about training her staff, it became clear that she enjoyed teaching and that by learning together, she and her staff had coalesced into a more cohesive team. Another rural surgeon talked about how she learned “what to ask” over the course of being recruited to three consecutive rural locations.

I know better what to ask... like at first I ask[ed], “Do we have fluoro[scopy] available in the OR?” And I should’ve... used the term “C-arm”. We had fluoro, it wasn’t available in the OR, and you know people answered, “Oh yeah.”... I asked questions wrong... And I never did get a C-arm. Well, I don’t have a C-arm here [in third location], so I can’t do certain studies... I can make them happen with plain films and different things, but I don’t have that kind of technology... When I moved to [second location], we didn’t have a sono tech. Well, we were doing more and more with sono, and we eventually got somebody trained, and I would maintain that it was because surgery needed it for various things, and that we were using it more and more. – Rural, Pilot #2

She had not been deterred from any of her three rural practice locations due to a lack of resources. As she pointed out regarding “plain films,” she figured out work-arounds. She also points out that sometimes you get resources you want, like the sonographer, and other times you do not, like a C-arm for fluoroscopy.

Tangible resources play a key role in determining what each surgeon’s scope of practice will be in his or her community, but their deeper meaning lies in how scope of practice

determines role. In urban areas, surgeons' professional roles tended to be comprised of a narrow scope of practice more akin to a sub-specialist. In rural areas, general surgeons tended to have broad scopes of practice and be more central to patients' primary care. The degree to which surgeons' personal and professional roles overlapped tended to vary in parallel with rurality, just as scope of practice did. Those with narrower scopes in more urban areas experienced less overlap, whereas those with broader scopes in more rural areas experienced far more overlap between personal and professional roles.

Resources and clinical judgments

For many rural surgeons, two resources in particular stood out as important, not only in building their practices, but in defining the breadth and complexity of their scope of practice. These resources were: intensive care units (ICUs) and blood banks. Not all of the rural surgeons in this qualitative sample had access to ICUs, nor did all of their hospitals have blood banks. One rural surgeon talked about the contrast between the urban center where she trained and her current, rural hospital:

I come from a level I trauma center, and we would call blood bank alerts... they were running coolers every, like, 7 minutes or 5 minutes up to the trauma bay or the OR until we told them to stop... Um, and what a security blanket. And now we don't. Um, that scares me. That's one thing, and probably the biggest adjustment for me is figuring out when to ship [a patient] and when not to. – Rural, #15

This rural surgeon described having blood products readily available as a “security blanket,” and knew that not having such a resource had to play a significant role in her decisions about what cases to include in her scope of practice. Another talked about critical care and said, “[S]o, you’re understanding that your ICU’s gonna be managed by a family doctor and yourself” (Rural, Pilot #1). Although there might be critical care resources present in the form of equipment or staff, there might not be physicians specifically trained in critical care.

Another rural surgeon referenced the absence of other medical and surgical specialties as he described coming to the realization of how broad his scope of practice was going to be in his new, rural practice location:

My first thing [here] in the ER, I saw a little girl put her hand in a corn auger. And I said, "I'm from [city] ... I said, "What the hell's a corn auger?" [...] I looked at it, and mangled, I said, "Well, you have to call plastics or ortho." And they looked at me, and [nurse] said, "Doctor, you are plastics and ortho," and I knew from then. – Rural, #3

He cut his statement short, but from the context he gave throughout his interview, it was clear that “from then” on out, this surgeon understood general surgery in a rural area would encompass work that in a larger setting would be considered under the purview of different surgical specialties or even sub-specialists.

When rural surgeons talked about continuing education or learning new procedures, it was clear they took pride in bringing new procedures back to their communities.

I've brought in procedures that [retired surgeon] did not do. So, a lot of the more advanced, advanced laparoscopic stuff, the laparoscopic colectomies, the Nissens, the hernia repair- laparoscopic hernia repairs, thyroids, that kinda stuff. Um, while tryin' to still maintain the stuff that [retired surgeon] did. And then, I'm just tryin' to, to do more cases, tryin' to just get more done. – Rural, #20

By expanding their scope of practice, they recognized they were expanding their communities' access to surgical services. This pride seemed to bring them significant personal and professional fulfillment. Some were frank about new procedures being a competitive advantage, not just an altruistic achievement. For example:

[S]o I bring another new procedure, um, that hasn't been done here, um, I'm only the 5th surgeon in the state that can do it... And so that means that I'm right smack dab in this huge circle that could be ours [the hospital's]. Um, and did the first 2 procedures last month, I have 2 more, um, on Thursday, and so, that's shifting how my practice is going. – Rural, #12

This surgeon saw his rural environment as working in concert with his skill set to produce a business opportunity for him and his hospital. If he had been operating in an urban environment, he likely would not have been the only surgeon in his catchment area offering this procedure.

Partners as resources as well as mentors

Workload, described in discussions of scope, volume of cases, and call burden, was an important component of a rural surgical practice, and it was linked to the presence or absence of surgical practice partners and how those in partnership or group practice work together. For some rural surgeons, having partners meant they could pursue a broader scope of practice. One surgeon who perceived his practice as rural said:

[T]hey encouraged me to do basically everything that I could think of doing. [...] And my approach was, eh, probably shouldn't be doin' this, because, you know, we're a rural hospital, and we're these little rural doctors, and this is probably over our head, and they were like, "What're you talkin' about?" [...] [Partner] was like, "I'm telling you, I think we can do this better" ... the real fuel, or the real nucleus of it all was that we had each other." – Rural, #10

Because this surgeon's partners had been in rural practice for many years when he joined, they had a sense of what the newer surgeon's scope could be and how they could support one another. He went on to say that as the practice grew and they grew their capabilities at their critical access hospital, they continued to see good clinical outcomes and knew they were on the right track in terms of scope and quality.

Another rural surgeon discussed a similar dynamic across the different generations of surgeons in his community, but he emphasized that they broadened their scopes of practice by teaching each other and learning on the job.

It's kinda neat learning how to do lap cholies because that came out after I... finished training... [L]earning how to do it, bringing back, and then teaching the older surgeons how to do it. And... that was kinda neat. Now I got the younger surgeons coming out, they all know laparoscopic, they're not familiar with open.

So, get to teach the younger surgeons how to do open stuff. So, it's, it's fun.
– Rural, #11

He enjoyed being able to learn from and also teach his colleagues, and that dynamic had the benefit of expanding the scope – and potentially quality – of services offered to their community. Another rural surgeon also reported learning from his partners and compared his experience to his understanding of how surgeons work together in urban areas:

I don't think many surgeons in bigger communities help each other as much as we did. I don't think they double-scrub some of the cases that we did. Some of the tough gallbladders, the colon resections, and some of those things. It's usually one surgeon, and we got to do those together, and it takes some of the pressure off, but it also allows you to learn other techniques and see how other people do things. – Rural, Pilot #4

A surgeon's overall workload and stress level was directly related to who else was available to help a surgeon with call and case volume. One rural surgeon who was usually in solo practice with a part-time partner explained:

[Part-time partner] offloads the elective volume just enough to where I can keep my head above water. And he comes down one weekend a month and covers me at both hospitals, so I get at least one weekend to shut my phone off and coast, 48 hours with my family, which is absolutely necessary. – Rural, Pilot #5

For him, 100% call was feasible but only because there were periodic breaks. He knew that without that 48-hour period, in which he could unplug from his practice and devote his attention to his family, his practice would be a very different and more negative experience. Another rural surgeon talked about the burden of call in terms of something that looms over you all the time:

I don't think anybody that's not on call understands what call does to you. And it's not that we get called in that much, because we don't. It's the burden of what you can't do because you're on call, because of the what-if. It's the burden of, "I've got three little kids at home, it's 8:30, my husband's still in the field, what am I gonna do if I get called in?" That's a constant kind of burning that nobody understands unless they take call. – Rural, Pilot #3

For her, it was the constant uncertainty of call and the inability to plan – for example, for child care – that was more burdensome than the emergency cases themselves for which she is called into the hospital.

Rural surgeons found that their scope of practice was shaped in part by the presence of and dynamics among their partners. In addition, their volume of cases and call time affected not only their surgical practices but also how they lived their lives. For someone in solo practice, having occasional help meant the difference between rural practice being feasible and not. For surgeons in two-person or group practices, the presence of additional surgeons meant less call time but also more help in the operating room, particularly on more complex operations.

The nature of urban surgery: for comparison, perspectives of urban surgeons.

Building a practice (urban)

Overall, urban surgeons talked about building their practices far less frequently than did rural surgeons. Across the sentiments were expressed, there was not a consensus about what building an urban surgical practice was like or what it required. One urban surgeon contended that getting started was not easy:

[W]hen you join with the group, then it's not like you're being handed anything. You gotta build, you still gotta build your own practice. And so, one advantage I had is that [retiring surgeon], who was a really prominent, busy general surgeon, was retiring about the same time I was starting. – Urban, #4

This surgeon acknowledged that the retiring surgeon's high volume and good reputation was beneficial to him as he entered into his group but did not ensure immediate success. In contrast, another urban surgeon joined an academic practice and he said he was immediately busy:

[W]ithin... like a couple days after I got there, my, my OR schedule was booked... I feel bad for... people that... are not busy when they first start, 'cause it just takes them awhile to build the practice. I never really experienced that. I never had to worry about that. – Urban, #23

Regardless of how long it took urban surgeons to build their practices, the focus was on referring physicians rather than word-of-mouth among patients.

Resources and clinical judgments (urban)

Whereas resources were consistently mentioned by rural surgeons in their decisions about what procedures to do or not and when to send patients to a higher level of care or not, resources were hardly ever mentioned by urban surgeons in relation to their scope of practice. This is likely because the tertiary and quaternary hospitals they practiced in have the most resources and did not pose limits to their surgical activities. Urban surgeons were more likely than rural to speak about areas of responsibility, such as covering the emergency department (ED) or the ICU or having to take trauma or general surgery call. Urban surgeons were also more likely to discuss teaching and research responsibilities, and they more frequently had more than one role: they were a general surgeon – either in private practice or in an employed model – but also held an administrative title within their hospital and sometimes also an academic title.

Urban surgeons occasionally discussed conferences or continuing medical education, but understandably, they did not discuss professional isolation, nor did they discuss bringing new procedures to their communities. They were most likely pursuing continuing medical education, enhancing their skills, and possibly learning additional surgical advances, but if they were, they chose not to highlight them in these interviews.

Partners as resources as well as mentors

None of the urban surgeons in the qualitative sample were in solo practice; all were in group practices, some of which were academic group practices. Rather than their partners playing a part in expanding their scopes of practice, as occurred in rural areas, instead their partners sometimes caused their scopes to narrow. In larger groups in urban settings, partners

sometimes became de facto sub-specialists, as their partners sent them one kind of case most frequently. For example, one surgeon joined a group of eight surgeons, and her partners referred many breast surgery cases to her. She said:

I got, not, not pushed into, but just as it happened, and I let it happen because I decided it was okay to do more and more breast surgery... I'd be okay with the better lifestyle of a breast surgeon, as opposed to a trauma and general surgeon.
– Urban, #31

While narrowing her scope of practice had not been her intention when she left residency, as she said, she “let it happen.” She expressed mixed feelings about this throughout the interview, even though here, she recognizes that narrowing her scope could yield a “better lifestyle,” which she explained previously meant taking less call and having more regular work hours. She knew this “better lifestyle” came at the expense of maintaining a broad scope of skills, saying, “[I]f I left, er, went someplace else... would I be able to do all those things again- I don't know..., I haven't done a thyroid in three years” (Urban, #31).

Interestingly, urban surgeons discussed their partners in relationship to their call burden just as frequently as rural surgeons did, if not more. Like some rural surgeons, some urban surgeons also drew the connection between call and work/life balance. One surgeon who practiced at a Veterans' Administration hospital said he thought he had a better work-life balance than a surgeon at other types of urban hospitals. When asked why he thought that was, he said

[I]t's residents... it's also having partners that I can hand off patients to or... more just share call with. [...] [A]t the end of the day... everybody's happy to share the work to take care of patients” – Urban, #2

It was not the fact that his institution was a VA hospital but instead the fact that he had partners and residents among whom the overall surgery workload could be distributed that he felt allowed him to achieve the work-life balance he wanted. Another urban surgeon said that having residents available did not necessarily decrease how many times he was called, but they

definitely decreased the number of times he had to physically go to the hospital after being called:

“The residents handle the majority of the stuff, call me for questions. Maybe three times a year I have to actually go in and do surgery” – Urban, #1

One urban surgeon, who was not in an academic practice and did not have residents sharing in his workload, said he had “fairly light call” because he has 12 partners. Although his call burden was not bad, in his opinion, he did say, “One of the downsides is the number of hospitals here... I go to 5 or 6 hospitals” (Urban, #4). He struggled to “keep it efficient,” and not lose too much time in transit among locations. This issue was echoed by several other urban surgeons who had operating privileges at several inpatient hospitals. Urban surgeons were more likely to describe one, central clinic location and multiple operating locations, whereas rural surgeons typically described operating at one hospital but sometimes having multiple, small outreach clinics in neighboring towns. This was not universally true; some rural surgeons covered surgical services or even took call at multiple hospitals. Urban surgeons’ multiple hospitals were all in their same city, but when rural surgeons were at multiple hospitals, those were spread across different towns, sometimes even different counties.

Urban surgeons were less likely to describe their partners as mentors or discuss the importance of joining a practice in which the other partners could serve as mentors. One did, however, and he said:

[M]y practice kind of developed as I hoped it would... I had my partners... good mentors... as I had questions, especially early on, managing patients and things like that, I always had them as sounding boards to, to talk to about, about patient issues, which was helpful. – Urban, #25

It is possible that urban surgeons think about their partners in the same way they think about other health care resources; that is, to a degree they take them for granted. More urban surgeons

than just #25, quoted above, very well could see their partners as mentors and more meaningful parts of their lives, but if so, they chose not to discuss it in these interviews.

The Role of Spouses in Practice Location Decisions: Introduction

Of the 30 male surgeons in the qualitative sample, all were in heterosexual marriages. Of the 7 female surgeons, 4 were not married, and the remaining 3 were in heterosexual marriages. The 4 unmarried surgeons included 2 who had never been married, 1 who was divorced and in a committed relationship, and 1 who had been widowed. All the surgeons, regardless of marital status, discussed the role of romantic relationships in practice location decisions, either from their own personal experiences or their observations of other surgeon-spouse couples.³

The role of spouses: the rural surgeon perspective

The ways rural surgeons spoke about their spouses and marriages fit into three main themes: 1) the importance of mutual decision-making, 2) the role of spouses' pre-existing social and family relationships, and 3) spousal attitudes and adaptability related to rural areas. Mutual decision-making overlaps in several ways with the other themes, and this will be noted throughout. These themes will be discussed in sequence, and the discussion will show variation in rural surgeons' perspective within each theme. Then, the urban surgeons' perspectives will be presented for comparison. At the close of this section, I will discuss several "special family circumstances" that made several urban surgeons in this sample unique. Because of the variation

³ While not all romantic partners were spouses, most of the surgeons in this qualitative sample were married, and the word partner in this context could be confused with surgical practice partner. Therefore, when discussing romantic relationships, the word spouse is used unless it is an incorrect characterization of the relationship, and when discussing surgery practices, the word partner will be used for physicians who are in the same practice with the surgeon.

within each theme and the ways they overlap, it is difficult to draw clear conclusions about spousal attitudes, values, and preferences in relationship to surgeon's practice location decisions. Therefore, it may not be possible to determine a universal approach to including spouses in rural surgeon recruitment and retention.

Mutual decision-making. Most rural surgeons emphasized the role mutual decision-making played in their marriages and their practice location decisions, although there were some exceptions. They usually said they and their spouses discussed the types of places where they would be willing to live. One urban-rural mover who married someone from a rural area said:

I just like... the Midwest. I guess it was closer to both our points of origin... [M]y wife was an only child, so she didn't want to tra[vel] ... neither one of us would go to a coast. Just don't like it. Nice place to visit, but, you know. – Rural, #11

Most rural surgeons and their spouses seemed to be in agreement throughout their marriages about the types of places they would be willing to live and what kinds of lives those places would yield. A rural-rural stayer had a similar experience, describing his spouse's "thought processes about urban versus rural living" to be "pretty much the same as" his (Rural, #19). He went on to say:

She was a elementary teacher, and was fortunately able to find jobs in each location that we moved to. So that worked out pretty well. [Wife] pretty much agreed with everything I was looking at... we both wanted to stay in the upper Midwest, and uh, not such large cities, 'cause we'd been exposed to [urban center] ... So yeah, lots of smaller communities, upper Midwest, we both were on board with that. – Rural, #19

This instance demonstrated that surgeons and their spouses both entered into the practice location decision-making process with pre-conceived preferences for type of place and the type of lifestyle they believe places would allow them.

In very few cases, surgeons described dictating practice locations with little to no input from their spouses. This unilateral decision-making was described as occurring because the

surgeon perceived their spouse did not have a preference in practice location, not because they wanted to impose their will without regard for the spouse's preference. For example:

[S]he didn't really care. I don't think, she said... "Whatever you wanna do is fine with me," but, I think she knew... she'd been here enough times to know what was going on... [S]he probably thought, "Well, where else're you gonna go?"
– Rural, #8

This surgeon felt that over the course of their relationship prior to getting married and deciding on a practice location, his spouse had learned about his background, his hometown, and the type of surgical practice he would likely pursue. His logic was, essentially, that she had not expressed opposition to that pursuit, so she must have been on board. Another rural surgeon expressed a similar sentiment, that his spouse was aware of his intentions.

I don't remember talking to her a lot about it because, because she knew I wanted to go to a smaller town... and she was fine with it because she was from a small, small town. [...] She was not real picky, you know, I mean there were, there were two and a half kids at that time... she knew she was gonna be very busy at home, and, and she was used to being in a small town, and she just thought, "This can work," you know? So... she didn't do a lot of looking around. – Rural, #26

This surgeon, while he did not think his spouse had a strong preference, did recognize that his spouse's background equipped her well for small-town living. He was confident that both of them would adapt well to living and working in a rural area. Another rural surgeon said about his spouse, "She was willing to go wherever. She really was" (Rural, #13). He described his spouse as a person who would be able to be happy anywhere, and therefore, it did not seem like his spouse played a large role in his initial practice location choice. These examples demonstrate, too, that mutual decision-making overlaps with other themes found in this sample, including spousal attitudes and adaptability.

Spouses' pre-existing social and family relationships. Depending on when during their education, training, or career surgeons met and married their spouses, different types of pre-

existing relationships played different roles. For couples who married earlier, during education or training, proximity to hometowns and relationships with parents or other family members seemed to play an important role. For couples who married later, after their careers had begun, the relationships that had formed around their professions seemed to play an equal or larger role compared to family. For example, one rural surgeon's spouse had been teaching in the town where they now live, so even though it was not the town where the spouse grew up, it was where she had established many personal and professional relationships. The surgeon said, "She had all these established relationships... so that also expedited the settlement to [current town], really" (Rural, Pilot #1). In that case, it was the spouse who had already rooted herself in a community because she was working there. In other cases, spouses had not yet established their own roots and respected the connections surgeons had established through their work. One rural surgeon, who married her spouse after she had chosen her first (and current) practice location, said, "[Spouse] said he wouldn't take me away from where I was practicing if this is where I wanted to be, since I was established" (Rural, #16).

It was more common for rural surgeons to have met and married their spouses earlier, during education and training. For these couples, proximity to family factored into their mutual decision-making process, usually with the goal of getting closer to family. One urban-rural mover talked about his preference for a rural area and how he and his spouse examined proximity to family during their mutual decision-making process:

[F]amily is really, really important to me... I didn't wanna be far from the [city] metro area because a lot of my family was there. And, I actually... had a map and drew a 500-miles radius around [city], you know, because I said, "We can get home in a day," you know, driving. And, so I, I wanted to be in that area, and I wanted to be in a smaller town. – Rural, #26

They looked at the map together and determined which small towns would be within the

acceptable radius. This is an example mutual decision-making overlapping with spouses' relationships. Another surgeon said he and his spouse looked at communities near the spouse's family. He said, "'Course my wife is from [neighboring town], so we ended up looking for a job close to her family," and he went on to say that they had considered locating near his family instead. However, his spouse did not react well to that location when they visited:

[Wife] didn't like it, and that was right after we found out that we were having [older son]. And so, I remember getting on the plane to come back home, and she said, "I don't think I can do this." I kinda suspected that she might have been feeling that way anyway. – Rural, Pilot #4

When asked what it was his spouse thought she couldn't do, he answered:

It was the cold weather. And just being that far from her relatives, her mom and dad and sisters. [...] Having the support of her family close... That network was important to her. 'Cause I think she envisioned herself being home alone with the baby, and not having anybody to turn to... Which, that would've been hard for her. Very hard. – Rural, Pilot #4

In that colder location the surgeon's spouse still would have had support from the surgeon's family, but she felt more strongly about having support from her own family. Notably, the surgeon suggested that the impending arrival of their first child was shaping his spouse's idea of what kind of support would be needed. This issue of support, either moral support as they became new parents or child care, came up repeatedly among rural surgeons and their spouses who considered proximity to family in their practice location decisions.

It is important to remember that close proximity to family was not appealing for every surgeon. For example, one rural surgeon and his spouse discussed finding a place that was far enough from family that they could avoid family drama:

[S]he's got two sisters and a mom that are all kinda in metro [city]. And if we get that close, then they'll start to, I think be more problematic than they are now. She just didn't want to deal with it. – Rural, #12

By being geographically farther away, the surgeon and his spouse perceived that they would be

able to live more independently.

For unmarried surgeons, it was sometimes their own hometowns, families, and other pre-existing relationships that factored into the practice location decisions. One rural surgeon had decided to practice rurally after having been widowed. She did not make her decision to move from an urban to a rural practice location based on any existing or potential romantic relationships. Instead, she wanted to return to where she grew up and be geographically close enough to spend time with family members. Similarly, one rural surgeon had been divorced twice and decided he would no longer make practice location decisions with potential romantic partners in mind. Instead, he wanted to return to his hometown, where he had long-standing family and social relationships.

Spousal attitudes and adaptability related to rural areas. Several rural surgeons said their spouses expressed a clear preference for living in rural areas, but here again there is an overlap with the theme of mutual decision-making. For example, one surgeon who perceived his location as rural said, “[Wife] and I wanted to be rural, so we took every hospital in [region] and kinda looked at ’em and interviewed at those places” (Rural, #7). The surgeon and spouse were in agreement about the type of place, and in this case the region, where they wanted to live, then they continued their decision-making process from that basis. One rural surgeon, who was practicing in his hometown and whose spouse was originally from a small town said about his spouse, “[S]he loves living in small towns. It’s what she wanted to do, live in a small town and raise a bunch of kids.” (Rural, Pilot #5). The surgeon perceived that his wife’s preference in location had to do with the rural lifestyle and perhaps size of town, not necessarily her own hometown. Another surgeon described his wife’s affinity for open, green space and said that her rural hometown is very much a part of her identity:

I mean, my wife is from here. So, to her, this is home. And she lived back in the east, and she knows the hubbub and the cities and stuff like that. She likes the green, she loves the grass. She likes to see the deer- that's my wife. She's from here. – Rural, #3

While this statement could be interpreted as his spouse feeling connected to her hometown, not rural areas more generally, his specification that she liked green, grass, and deer suggested that even if they had not settled in her hometown, she would have been drawn to a more rural location rather than more urban.

Only in one rural surgeon's case did the spouse's career take precedence; her spouse wanted to pursue a career in agriculture, which necessitated locating in a more rural area. When spouses did not have careers outside the home, or when their careers were not contingent on a specific location or type of location, surgeons reported their spouses were largely flexible in practice location decisions and supportive of the surgeon's career choices.

Occasionally, rural surgeons reported that their spouses had been reluctant to locate in a rural area. In some cases, spouses hid their reluctance until after the location decision was made. Some surgeons thought their spouses were reluctant because they feared isolation and feeling like an outsider in what they anticipated would be highly interconnected communities. Some surgeons even said their spouses resented the location at first, but these surgeons had been confident that their spouses would adapt and become happier with the location. One surgeon said his spouse dealt with their move to a rural area by imposing a time limit, saying she would only live in the rural area for four years. Another surgeon made a compromise with his spouse, establishing his practice in a very small town but having the family live in a nearby, larger town, so that his spouse could have greater access to more urban amenities. He described her initial impressions, then their process of compromise, this way:

I think she was thinking..., “There’s nothing around here, man. What’re you doing? There’s just cornfields.” ... And I don’t think it ever really got verbalized, but there was that kind of like, eh, “I can’t live like that.” ... But so, that’s kind of why we moved to the town we did, and it was fine then ... if you talk to my wife, and she’s honest with you, she’ll say, “I wouldn’t do this any other way.” She loves being out in the country. She absolutely loves it. – Rural, #9

This rural surgeon perceived that over time, his spouse adapted to living and working in and around small towns. Because of the compromise they struck toward the beginning of his practice, they both have found a lifestyle they enjoy in a place they both appreciate.

The role of spouses: for comparison, the urban perspective

Mutual decision-making. Urban surgeons, like their rural colleagues, indicated they relied primarily on mutual decision-making with their spouses as they considered practice location choices. One urban surgeon who had academic responsibilities was willing to consider moving for the sake of advancing his academic career. As he began exploring his career options, he cast a wide net geographically before getting more serious about the search and sitting down with his spouse:

[M]y wife and I sat down, and I was interested in moving into a higher leadership job, so we sat down, and she said, “Nope, not there, not there,” and I’m like, “okay.” So I was like... “Why don’t you draw me in the map where we’re allowed to- where I’m allowed to look at jobs.” – Urban, #17

This surgeon went on to explain that he did not consider jobs that were in locations unappealing to his spouse. It was clear that he and his spouse had been generally in agreement for many years, though – potentially their entire marriage – about the types of places they would like to live and work.

As in some of the rural surgeons’ cases, there were urban surgeons who took a more unilateral approach to their practice location decision. One urban surgeon, who is now in his third practice location, had initially practiced in the same town where he completed training and

met and married his spouse. He described their first move, away from his spouse's hometown, this way:

I decided I need to go find a new job. I told her we were goin' to [new city], she was devastated... it really rocked our marriage for 4 or 5 years in [new city].
– Urban, #18

While this surgeon made a unilateral decision in the context of his marriage, the unmarried surgeons in this sample in a sense only made unilateral decisions. One did talk about her decision-making process in the context of seeking a spouse:

[W]hen I graduated, I would've stayed in [rural area] if I was married and had a family. But... I knew I was never gonna meet anybody there, and ... if I had been with someone, had a family, I would've stayed in [rural area] in a heartbeat... I'm still single, interestingly... I thought leaving [rural area] would increase my dating prospects, and turns out it hasn't really, so. – Urban, #31

This surgeon may not have been considering her practice location in the context of a current spouse, but she was thinking about potential future spouses.

Spouses' pre-existing social and family relationships. Urban surgeons less frequently mentioned their spouses' pre-existing or family relationships in potential practice locations. Some urban spouses had pre-existing relationships in a city because of their careers. One urban-urban stayer noted that while he was applying to medical school, he and his spouse (then-girlfriend) could consider almost any location because, "At that time in her career, she was flexible, and we were both young" (Urban, #29). Another urban-urban stayer said that by the time he was going into residency, his spouse was established in her career in a certain urban center:

I think the thought process was, if [city] didn't work out, then it would be best that we were in a big city so that if [spouse] had to change jobs, you know, either [company] would have an office there, or there was [sic] other opportunities for her. So, we were really looking at pretty big cities for that reason, for her job.
– Urban, #25

At one point, he and his spouse considered other locations, but they felt strongly about staying in that city or similarly-sized urban areas because of the spouse's career.

Spousal attitudes and adaptability (urban). Only a few urban surgeon's spouses expressed reluctance to move to any location – urban or rural – during practice location decisions. Of those, most of the concerns centered around distancing themselves geographically from family or moving to a place with fewer amenities.

One urban surgeon in a largely rural state said his spouse had been sad to move away from family, but it turned out years later that their son moved nearby, and the son and his wife have children. This surgeon said:

For her [his spouse] it's always been her, torn between her own family ... and her kids... But now that [son]'s moved here, and you know, we've got a couple of – we got one grandchild and another one on the way – so she's, she's like ecstatic.
– Urban, #23

During the interview, he clarified that “her own family” meant her parents and siblings. The surgeon attributed part of his spouse's adaptation to their current location to circumstances changing: their son arrived. In other cases, surgeons perceived that their spouses changed internally or were intrinsically adaptable. A couple urban surgeons said that while their spouse did not initially want to move to a city, they eventually grew to like it as they discovered its amenities, ease of transportation, and established social circles.

Special family circumstances

A few other spousal dynamics emerged in the urban group that merit a brief discussion. First, some surgeons experienced special circumstances that affected their ability to choose a practice location. For example, one surgeon had married a woman with children from a previous marriage, and they were unable to move out of their current state per the custody arrangement. Another surgeon's wife had become disabled, limiting their ability to move. Still another surgeon

had a son with special needs, and he expressed it would be difficult to find another place with sufficient medical care and support services.

Discussion

Rural surgeons reported that in smaller communities, there was a high degree of interconnectedness. They found meaning in this social fabric because they experienced it as people helping each other out and developing relationships not only with individuals but with entire families. The downsides of this tightly-knit social fabric included the potential for bad news to spread quickly. While good news could also travel by word-of-mouth and benefit surgeons as they built their reputations and practices, one bad outcome could disproportionately harm those same efforts. Many rural surgeons reported having a quasi-celebrity status in their communities, becoming known as the town surgeon and with that recognition being expected to participate in community activities. These expectations were not viewed as burdens; instead, they were viewed as evidence that the surgeon was wanted and needed in the community as both a surgeon and a person, which many said they appreciated.

Rural surgeons made many observations about space and rural areas being less crowded, more peaceful, and quieter. Some found a refuge, of sorts, in the natural landscape, much like how some described their homes. The meaning they attached to community infrastructure was notable as well and is an important point for communities to keep in mind as they work to recruit surgeons of varying ages. Communities could consider prospective surgeons' stages of life and professional goals and think about whether those are consistent with the community's goals for its future. If they are, this could be a selling point for the prospective surgeon.

The qualitative data presented here regarding health resources and scope of practice tie into the quantitative findings from Chapter 4. As communities are working to recruit surgeons,

they must consider the surgical infrastructure, such as the hospital and its facilities, other health professionals necessary to peri-operative services, and specialized equipment. For rural surgeons, these resources are at the core of decisions they make about patient transfers and the complexity of cases they are willing to manage. These decisions are somewhat fraught, at times, for rural surgeons, as the patients they are transferring are not usually strangers. In towns where “everybody knows everybody,” the surgeon cannot stop knowing someone as he or she considering whether to operate on them or send them to another town for care. Communities in the recruitment process need to be aware of these less tangible, indirect effects of investment in health resources. They should also be aware of the effect that the medical community overall can have on their recruitment ability. Other surgeons are potential mentors for future surgical partners, and they represent the ability for a future surgeon to have a slightly less demanding workload. Surgical partners can also take some stress off of one another by providing moral support and additional expertise during complex or complicated cases. Workload and stress matter to potential recruits.

These data do not yield a straightforward approach to enticing surgeons’ spouses to rural areas and suggest tailoring efforts to spouses may not be necessary. More often, couples are making practice location decisions mutually. Spouses are mentioned in the literature as important factors in practice location decisions (Mayo & Mathews, 2006). The implication sometimes is that spouses do not want to locate rurally, or if they do, it is only because it is near their family. The findings from my qualitative sample suggest these may be overly simplistic conclusions. My data show that across urban and rural surgeons, while spouses often had clear preferences about the types of places in which they were willing to locate, seldom did they dissuade surgeons from

locating rurally. More often, practice location decisions were made mutually, often taking into account both spouses' careers and sometimes proximity to family.

Chapter 7: Identities, Roles, and Place Integration

Introduction

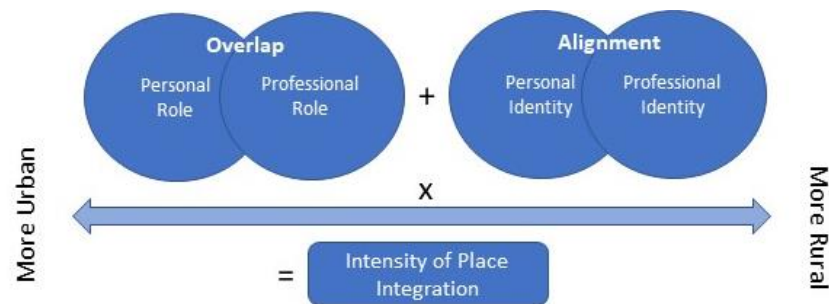
Chapter 7 deals with the relationships among several key concepts: identity, role, density of acquaintanceship, and experiential place integration. Whereas identities were how surgeons saw themselves, roles were the parts they played in the various aspects of their professional and personal lives. Surgeons in this sample discussed the development of their personal identities over time, and these are presented here in two parts: their “original” identities, or those formed prior to adulthood; and their current, personal identities, centered on how they currently see themselves. They also discussed how they perceive their personal identities align with their professional identities as surgeons, and in these discussions, they offered perspectives on the surgeon archetype. In their discussions of role, rural and urban surgeons diverged. Rural surgeons reported that their non-surgical/personal roles frequently overlapped with their surgical/professional roles. One example of this was interacting with patients outside of the clinical setting as friends and/or neighbors. As discussed previously in this dissertation, they said that in smaller towns, “everybody knows everybody,” a concept referred to as a high “density of acquaintanceship” in the literature (Freudenburg, 1986).

The final key concept in this chapter is experiential place integration. Previous research has defined place integration as “the activity of becoming a part of a place” (Cutchin, 1997b). Data from the pilot interviews for this study suggested that the intensity of a surgeon’s place integration was important in surgeons’ initial community choices and choices to stay or move. This is supported by previous research that has found experiential place integration to be instrumental in rural physician retention (Cutchin, 1997a, 1997b). In the tradition of grounded theory, themes were allowed to emerge from the qualitative data, and so experiential place

integration was not explicitly sought in the data analysis (Charmaz, 2014; Corbin & Strauss, 2015).

This chapter will illustrate through the data how surgeons' alignment between their person and professional identities adds to the overlap of their personal and professional roles, then interacts with their communities' density of acquaintanceship to produce experiential place integration of varying intensity. For a graphical depiction of this combination of factors, see Figure 13.

Figure 13: Identity Alignment, Role Overlap, and Density of Acquaintanceship Together Produce Place Integration



Findings

First, perspectives of rural surgeons will be presented on their personal identities and their surgical, or professional, identities. Then, I will present perspectives on the overlap of personal and professional roles. Finally, I will present evidence related to place integration: data that demonstrate surgeons have integrated into their communities over time. Then, perspectives of urban surgeons will be presented for comparison.

Personal identity: the rural surgeon perspective

Rural surgeons identified a number of values that were central to their sense of identity. These included common sense, honesty, independence, drive, self-motivation, faith, selflessness, and hard work. They described themselves in a wide range of terms, not just personality

frameworks like introversion or extroversion. One surgeon said, “I’m not a business person by any means” (Rural, Pilot #3). Another simultaneously identified as having a “soft heart” but also wanting to be like a cowboy because they’re “so frickin’ cool” (Rural, #9). Many rural surgeons stated that while their sense of identity had evolved over time, they still felt a significant connection to portions of their identity that had been established prior to becoming a surgeon, such as during childhood.

Most rural surgeons had inclinations toward science, medicine, or surgery at young ages, some as early as third grade. One urban-rural mover said he knew he was interested in medicine by third grade, and by fifth grade, he knew he wanted to be a doctor:

[I]n third grade... I started with a project on eyes. And then from that point forward, it was something medical. Heart, brain... after several year of, of doin’ science fair projects and, and doing well with them... it was clear that medical sciences appealed to me. [...] It was neat! [...] [A]nd it didn’t bother me being around, you know, hearts and brain tissue... you know, people are like, “Eww, how could you handle that?” I say, just... because. It’s here and you can see... – Rural, #11

Another rural surgeon described feeling similarly about anatomy and medicine during high school:

We actually had a medical careers class in my high school that allowed us to go and shadow each different medical profession... I remember... goin’ into the OR and seeing the first open abdomen case with bowel out... and I said, “That’s what I want to do.” [...] [M]ost people can never see the body from the interior. You can read about, or you see pictures, but it never truly grabs what it’s truly like to actually see the bowel, or actually see the bowel start moving, like, the peristalsis, how you digest, actually see a gallbladder, liver, everything actually wide open, and to see how you can actually go in somebody, open it, take pieces out, and put it back together, just like mechanics, and it all works out. So... I just thought it was always interesting how that can happen. – Rural, #14

These surgeons and others reported that medicine and science become integral parts of their identity early on in life. No matter whether they had been brought up on a farm, in a small town,

or in a larger town or city, all of these rural surgeons discussed values, attitudes, and preferences that had been ingrained in them early in life and were still relevant in their lives.

No one personality type was more dominant than any other among rural surgeons in this sample. Some surgeons defined themselves as homebodies or introverts, like one who described himself and his wife as “status quo settler types.” There were also surgeons who identified as more gregarious. A couple rural surgeons said that although they could be social, at the end of a long workday, they did not want to be. They preferred to be home, either alone or with their families, as opposed to socializing with friends or neighbors. This tendency may be related to findings previously presented in Chapter 6 regarding the importance of surgeons’ homes.

Surgical identity: the rural surgeon perspective

Rural surgeons named many personality traits and behaviors they considered to be part of a surgeon archetype. However, almost none of them considered themselves aligned with negative traits they named like being competitive, caustic, or egotistical, and this could be evidence of social desirability bias. They did admit to being impatient and not being great managers. One said plainly, “we [surgeons] don’t have a lot of tolerance for stupid” (Rural, #7), and another said, “I have such a low tolerance level for whiners” (Rural, #21). It is important to note that these comments were made regarding surgeons’ treatment of their colleagues, not patients.

Some rural surgeons said traits like being decisive, independent, and fearless, were desirable. The surgeon who said being ‘caustic’ was part of the surgeon archetype, also said:

[T]hey’re leaders, no question... they’ve got broad shoulders... they can take, you know, what happens.... [T]hose are all the things that I wanted to be. That’s why I wanted to be a surgeon... but there’s definitely a surgical personality. You can pick it up even in medical school... And I hoped that I wouldn’t be that way.
– Rural, #13

This surgeon and others expressed not wanting to have or develop negative traits. Some had these realizations during their education and training. For example, this same rural surgeon recalled sitting in a hallway with several other fourth-year medical students waiting for their residency interviews:

[T]hose interviews were the worst of the worst, all these people that were cutthroat, and they were, you know, competing, and they were all boasting, their chests were pumped out about how many gallbladders they've done in medical school themselves, you know, just the kinda thing I didn't want. – Rural, #13

For him, being too competitive and boastful was distasteful, and he did not want to adopt such attitudes and behaviors. Rural surgeons were also able to identify the ability to adapt to changing circumstances and to be comfortable working in chaotic environments as positive traits they perceived as part of the surgeon archetype as well. Many reported aspiring to positive traits and some spoke about role models who helped them become the kind of surgeon they wanted to be.

Identity Alignment: the rural surgeon perspective

The rural surgeons in this sample made many observations about their own personality traits or tendencies and why those made surgery a good ‘fit’ as a profession. Those who were rural-rural stayers with agricultural backgrounds indicated agriculture helped shape their values, attitudes, and preferences, and some even used agricultural analogies to describe surgery. This was one of several signs of an alignment between professional and personal identities. One surgeon, whose father and brother still farmed their family’s land, recounted a conversation with his father:

[M]y dad asked me... he's one of those kinda tough, thick-sinned farmers that would never tell ya he loved ya, okay? But he would give you the shirt off his back, right? And the only time he ever asked me about medicine, he said, "Now [name], when I get to the end of the field, and I've pulled the wrong lever, I just put my foot in on the clutch. What do you guys do?" You know? And I said, "Well, we fix stuff." [...] And that's the point... If you look at one of the guys that I respect that trained me... technically a wonderful surgeon, he's just like my

dad... he just takes a goal and he gets to that goal no matter how he has to get there – through the right means, I mean. – Rural, #7

He said several times that “what we do as surgeons... it’s the same thing we do as farmers.” He saw the two professions as having similar attitudes toward work and relationships, not only in being persistent but also being “tough” and practical.

Another rural-rural stayer connected working on a farm with surgery as she discussed entering surgical residency. She said, “I knew I could work a hard day, goodness, I’d done it on the farm” (Rural, Pilot #2). Similarly, another rural-rural stayer discussed how working on the family farm while growing up had prepared her for surgical residency and practice:

[Dad] ... wanted to make sure that we were workin’ on the farm and we had good work ethic, which served us well... [L]ater... residency, doing things when you didn’t feel like doin’ things, doing things when there was no reward... [T]here’s a lot of work done on the farm where you don’t see any reward out of it, but you do it anyway cause it’s the right thing to do. That’s the kind of thing I think that’s served me well in the trenches... just, doing it for the right reason, doing work for the right reason, maybe not for the reward. – Rural, Pilot #3

When asked about specific examples of when she has had to do “the right thing,” she elaborated:

*I think that kinda thing comes up every time you make a choice. You make a choice to stay late, you make a choice to stand by a patient’s bedside and hold their hand as opposed to go finishing up your charts and going... even to be with your family. You make a choice to commit yourself, um, when nobody’s watching. [...] I know that sometimes I make a conscious choice based on those kinds of things, and it’s deeply rooted. It’s not something that I decide that day. It’s just part of me, and that’s part of what came from the [farm] background.
– Rural, Pilot #3*

These rural-rural stayers identified with characteristics like toughness, having common sense, and “doing the right thing.” They expressed a remarkable degree of alignment between their personal identities and their current, professional identities as surgeons.

Especially for the rural surgeons who did not come from agricultural backgrounds, the ways they spoke about work/life balance provided evidence of the close alignment between their

personal and professional identities. One rural surgeon said, “I have... what I call a life from which I do not need a vacation. I’m a great believer that you need to, if you will, bloom where you’re planted” (Rural, #6). One rural-rural stayer said, “[W]hat we do isn’t really, like... laboring on a job. It’s not like you feel like you’re stress, ohh, I gotta take time off, I’m dyin’ here, you know? ... We don’t do that” (Rural, #8). These surgeons represent those who felt such a close alignment between personal and professional identity that they felt no need to separate those aspects of their lives. Some surgeons seemed to say that this close alignment was proof that they were dedicated to their patients:

[W]hen I went into medicine, it was really a vocation and profession. In fact, I waited, I didn’t even get married ’til after I got... my MD degree. [...] [Y]ou put medicine first and your patients first. – Rural, #3

This sense of devotion was echoed by several other rural surgeons, one saying, “[I] felt the personal responsibility to do this... to our patients and be available as often as we are” (Rural, #9). His use of the words “personal responsibility” to describe his professional obligations showed his identity alignment. Still another said she felt called to be a surgeon, saying, “I don’t do what I do for the money. I do it because I really believe that’s what God wants me to do” (Rural, #15). Another surgeon made a similar remark about her faith:

[I]t’s still very faith-based... I’m the person standing there, but... I’m an instrument. That’s how I feel. That’s how I view it... I like being the instrument in that situation, but I don’t think that’s me doing that. That’s just myself and my beliefs... I like the opportunity to serve in that way. – Rural, Pilot #3

For both of these surgeons, there was a clear and meaningful tie between their religious component of their personal identities and their professional identities.

Although rural surgeons named many reasons why they did not fit a more negative version of the surgeon archetype, they were also able to articulate clearly why surgery does fit them, why they chose the profession, and why it is appealing to them. The trait of impatience,

identified earlier, was closely tied to surgeons' tendencies to be task-oriented and want to fix things. One rural surgeon, who drew on her agricultural background, said:

I kinda knew I wanted to be a surgeon, because... as a farm kid... you can say okay, we finished painting the hog house, we got the cows milked, we got the barn cleaned... very objective. Surgery fills that for me. At the end of the day, I took this gallbladder out, fixed this hernia, put this chest tube, so I can tally in my mind exactly what I did, okay? [...] I'm a doer, so, that part of it very much fit my personality, and I could account for... I had earned my keep of that day.
– Rural, #21

This surgeon was self-aware enough to put those pieces together, realizing she enjoyed or even needed to be able to account for what she had done on a daily basis in order to be fulfilled. Other rural surgeons made similar comments about getting things done but spoke in terms of being “doers” and wanting to “fix.” For example, one said simply, “There’s somethin’ broken, I love to fix it” (Rural, #10). Another drew a clear connection between his personality and this desire to fix, saying, “I’m kinda short, sweet, to the point, here’s the problem, I can fix this problem, and get to a resolution and move on, so it [surgery] just seemed to fit” (Rural, #12).

Others described the discovery of surgery during medical school as finding “their people,” a group that thought and acted like they did and shared similar interests and attitudes. One said, “I just felt like I fit with those people. I thought how they thought, you know?” (Rural, Pilot #5). Similarly, another rural surgeon said:

So you go through all these rotations as a third-year, and you figure out who you’re like... I figured out, these are my people. I’m like these guys. I function like them, I think like them, I wanna move like them, and that’s how I figured out what I wanted to do. – Rural, Pilot #3

Another referenced medical school rotations, too, and said the following:

[W]hen you’re in that specialty... rotating through those residents... you say, man, these are just like me... wow, these are the kind of people, okay... I’m finally feeling like I’m with these people. – Rural, Pilot #1

Several rural surgeons were told at different points in their education and training that their personal identities were misaligned with the surgical identity. They were told they were not surgeons, meaning they did not fit the archetype and therefore did not belong in the profession. For example, “[E]verybody’s told me my whole training, you’re not a surgeon. What’s wrong with you?” (Rural, #13). Another rural surgeon talked about her residency interviews and others not perceiving her as surgeon material. She said, “[T]his one other program... they were the people that told me I was too nice to be a surgeon, they didn’t think I could survive” (Rural, #15). In spite of being told by educators, attending surgeons, or other colleagues they were different or did not fit, these surgeons went on to complete surgical training and become practicing surgeons. They were confident enough that their personal identity did align with that of the surgical identity that they were able to push aside these detractors and successfully complete their training and enter practice.

Taken together, these data show that rural surgeons were generally in agreement, with some variation, about the negative and positive characteristics they associated with the surgeon archetype. They admitted to having some of the negative traits and aspiring to the positive and showed significant alignment between their personal and professional identities.

Role overlap: the rural surgeon perspective

Rural surgeons demonstrated through a number of statements how their professional roles as surgeons and personal roles as friends and/or neighbors overlap. One surgeon gave an example of this overlap using a story from when he first moved to town:

I learned early on some of the church festivals you have to get there early... they’re so popular they run out of food... [T]here is a church in town... had this turkey dinner that’s to-die for. And I learned one time, showed up with my family, and it was a half-hour before it was supposed to be over... And [we] get there [and say], “Oh yeah, that’s okay, you know, never mind [about the food].” And,

“Oh, oh, doc, you sit down!” And they, I don’t know where they found meals for, I, myself and my family, but they did. And it’s, you know, that’s what they do.
– Rural, #11

For this surgeon, the hosts calling him “doc” and bustling around to find food for him and his family made him feel welcome and was a meaningful experience. It was also a demonstration of him being treated simultaneously as a surgeon and a friend/neighbor. He was an urban-rural mover who also learned to garden so he would have a hobby in common with many of his patients. In so doing, he was actively engaging in overlapping his personal and professional roles, finding a personal activity that he could discuss as he acted in his professional capacity.

Rural surgeons discussed that this role overlap causes them to take patient outcomes personally, makes bad outcomes emotionally difficult, and causes them to struggle with decisions to transfer patients because they know the personal effects transfers could have on patients and patients’ families. One rural surgeon who had previously lived and practiced in an urban area discussed the value he placed on role overlap, being treated not only as a surgeon but as a friend/neighbor:

I was coming back to a place where somebody actually cared about me. Because in big cities, nobody actually cares about you. Other than your family. Hopefully. Hopefully your family cares about you, but other than that, and you may have some small circle of friends, but, uh, in general, no, you’re not valued as a human being. [...] It’s always been good. Best decision I ever made in my life was to come home. – Rural, #6

Granted, not everyone in a big city experiences a lack of connectivity. The caveat should be made that this surgeon had experienced two divorces by the time he decided to leave the urban area and return to his rural hometown. It is possible that the breakdown of his romantic relationships colored his view of urban living. However, he did not indicate that, and other rural surgeons’ experiences supported this perception of smaller towns as meaningfully interconnected places. For example, some who had experienced urban living said larger communities were more

impersonal and somewhat socially isolating. One rural surgeon described his community as the place where all aspects of his life were happening simultaneously:

[I]t's your church community... where your kids go to school... That means a lot to, I think every one of us [in the practice]. [...] It's kinda artificial in certain places, right?... Suburbia, place where I go visit my, you know, uh, in-laws... how real is that stuff, you know?... [I]t's probably fine, but my opinion is, not as real as what this is. [In small town] everybody's just bein' honest and doin' the right thing and not worried about any false pretenses of tryin' to have this or that.
– Rural, #9

He perceived that the overlapping of his faith community and children's school and surgical practice – both his personal and professional roles – was meaningful and perhaps played a part in keeping everyone “honest and doin' the right thing.” He went on to discuss the overlap between the community at-large and his patient base:

I think, that word, community, is the reason that we choose, that I choose not to leave, 'cause the community is really made up of patients... I couldn't ask for a better patient base. Now maybe we develop that with the trust and the effort we put forward over the last 25 years in my case... And you do feel, since it's small, that they are family, somewhat, you know? – Rural, #9

Not only did he view the entire community as his patients, but he recognized that a great deal of trust had been developed over a long period of time. One urban-rural mover described a similar closeness with his entire community:

So, there's almost no one that you haven't touched their lives here. So, you're part of a real, you're part of a community. Everyone knows you. Everyone hopefully loves ya. You take care of them. – Rural, #3

Both he and the previously-quoted surgeon used the word community to describe the social fabric of their small towns and the overlapping nature of their roles.

Additional evidence of the overlap of professional and personal roles materialized in rural surgeons' discussions about their commitment to their patients. They talked about going into the hospital even when they were not on call if a patient specifically requested them. They fulfilled

the professional role because of the pre-established personal roles, the friendships, developed between them and their patients. One rural surgeon recognized the tension in these situations:

They want you to be available 24/7, and it's hard sometimes to say no and have some separation... [O]ver the years I, I would just say, "Oh, oh yeah, I'll come back, I'll come see you, I'll take care of it." Or, doctors in the community would say, "I really want you to take care of my patient. They don't want to see so-and-so who's on call, they really want you. You're not on call, but-" and it's like, sometimes you have to say no, and that's really hard. I guess that's the hardest thing... not being available 24/7 when you see the need. – Rural, #16

This surgeon was suggesting that by saying 'yes' so many times over the years, she herself had contributed to the overlapping of her professional and personal roles.

Several rural surgeons told stories of seeing patients in public, who then proceeded to discuss their healthcare, show the surgeon their post-operative wound or scar, or ask them for medical advice. One rural surgeon said, "If I was in [big city]... I would never ever see my patient outside of that exam room. Here, aisle five of Wal-Mart, they're showin' me their scars" (Rural, #3). Another rural surgeon also referenced the ubiquitous Wal-Mart, and said:

Oh gosh, I go to Wal-Mart, I'm checking incisions, I'm looking at skin lesions. [...] I don't mind it. [...] [E]very time I'm in the pharmacy section, everybody's like, "Which vitamin's better?" Oh my lord. Frickin' surgeon. I don't know, man. But I get that all the time. – Rural, Pilot #5

These instances of patients engaging with the surgeon's professional role while in a space where he or she was acting in a personal role are yet more evidence of how roles tend to overlap in rural settings.

Place integration: the rural surgeon perspective

Many rural surgeons experienced an overlapping of their personal and professional roles and described how it produced their experiences of place integration. Prior to choosing their practice location, though, some rural surgeons had preconceived notions about the tie between

identity and place, and this merits attention prior to more in-depth discussion about place integration.

Identity and place. One rural surgeon was very clear about the importance of personal identity matching the type of practice location. At one point, he had been offered a position in an urban surgical practice, and he told those offering, “You need to find somebody who’s a city guy” (Rural, #8). In his mind, offering an urban surgery position to someone who was a rural person did not even make sense. He seemed to feel very strongly that identity was inherently tied to place. Many rural surgeons did identify in this way, as small-town people or, phrased in the negative, as “not a city person.” For example, one surgeon said about herself and her husband, “[A]s far as more rural, I think that was kind of decided for us. We are not city people... that whole pace of life that, even that culture is not us at all” (Rural, #15). In spite of that self-identification, she had considered staying in the city where she was completed her residency, and she recalled a conversation with her husband that re-focused them on the importance of community fit: “He said... ‘Our whole point was we wanted to make a difference, and I don’t think we’re gonna make a difference in [residency city].’” She said she was “100 percent for” choosing a smaller town where they would both feel they were making a positive difference. She then connected her earlier comment about culture with this choice to locate rurally:

[T]he culture here, it’s a culture I can relate to. It’s a people I can understand. Um, my family lives in [another small town] ... I have great aunts and uncles, my grandparents’ siblings, that are not well-educated, and some of them have not even finished high school, some of them could not read... I can understand that kind of culture. I can respect the people who were so busy working they didn’t have time for an education... that was their culture, they were tryin’ to take care of their families. Like, the inner-city problems... that’s not a background I understand very well. It’s very depressing to me when... they come in and they’re doing so well, and then they relapse, and it’s like, you feel like you’re really not getting anywhere, you’re not helping anybody... I don’t feel that way about a place like this. – Rural, #15

For her, choosing to practice in a rural area was partially attributable to her personal identity as someone who is not a city person, which was formed in part by her family background.

Some surgeons showed their perspectives on the tie between identity and place as they talked about having tried to visualize themselves in potential locations. One said, “I never really saw myself being somebody that would stay in a big city for very long” (Rural, Pilot #4).

Another briefly entertained the idea of going into practice in a suburb of a large city but ultimately decided against it, saying, “I didn’t see myself in that kind of environment... just didn’t see myself there” (Rural, #9). These surgeons could not reconcile their conception of their identity with their perception of what life would be like in a larger community.

While the most common way rural surgeons described themselves in relationship to community was small-town person versus city person, some surgeons identified more with the Midwest as a region or with their home state, rather than a particular town or type of town. Some reported they had always intended to remain in or return to their home state to practice. Others were more specific, identifying with particular parts of their state for various reasons. One rural surgeon said:

“I’m a western [state] person... [eastern] was kinda humid... it just didn’t feel right... [Western] felt more like home. You know, I related to the people better. I just, just there was more similarities.” – Rural, Pilot #2

This surgeon wanted to find a place that felt right, and once she did, she wanted to establish and live a life in which her professional and personal identities overlapped.

Experiences of place integration. It was important to rural surgeons to find a place that “fit.” They wanted to find places where they could experience the degree of overlap between their professional and personal roles that would yield the intensity of place integration that would best suit them. The rurality of a community and its density of acquaintanceship was a key part of

this equation. The more prevalent the “everybody knows everybody” phenomenon was, the more likely the surgeon was to have a more intense, or concentrated, experience of place integration. One rural-rural stayer described the overlap of her personal and professional roles and an intense integration experience as her ideal:

Incorporating into community, making it home... Trying to build something there, as far as surgery... just integrating into the community. [...] [J]ust having a home, finishing my practice. I mean, I didn't plan on moving again, if I made it home, I was going to make it work... Be their surgeon. Try to treat 'em right. And just, you know, be the farm kid that I was, and yet be the surgeon too, and kinda have both worlds. – Rural, Pilot #2

She defined fulfillment and long-term success as having “both worlds,” personal and professional, and the way both interacted with her rural community formed the basis of her integration into the community, “making it home.”

The most clear evidence of place integration of varying intensities was found in rural surgeons’ stories about specific patients whose cases were emotionally impactful. One surgeon pointed out why cases can be so emotional and personal:

[M]y mantra... is, you know, everybody is somebody. I talked about having to work on my friends and how that elevates my anxiety a little bit, but everybody is somebody, especially in a rural community. That's somebody's mom. That's somebody's friend. That's somebody's sister. – Rural, Pilot #3

While any surgeon may recognize “everybody is somebody,” the difference in rural areas is that this sentiment is not abstract or hypothetical; it is reality. Rural surgeons recognize that these dual relationships, like friend and surgeon, can be challenging, but they also value forming these relationships and seeing long-term outcomes. For example, one surgeon saved the life of a child whose condition had been misdiagnosed elsewhere:

[W]hen he came to the emergency room... I said, oh, you're, it's, just snowing out, you're too sick to go anywhere else, I really think you have a mid-gut volvulus by the story. And his mother is very dubious, and said, no one at the children's hospital's ever mentioned such a word... I said, he needs to go to surgery now, it's

gonna lose its blood supply. And twisted bowel. He's 23 years later, he's working in a wonderful job, and he's grown up... they send me a Christmas card, and I saw the progression of his aged [sic]. His mother works here as a secretary now, and she comments all the time about, "he wouldn't be here if you hadn't taken care of him." – Rural #16

She took great pride not only in saving a life, but in having a relationship with the patient and his family for such a long period of time. Another surgeon had two examples of cancer patients with whom she clearly feels a friendship as well as a professional relationship. She talked about the first patient this way:

[O]ne... she's not got a good prognosis at all, her cancer will probably take her. But she comes in every couple months... looking so cute in her different wigs and hats and stuff and hugs me and is so cheerful and so happy, and we chat about girl trips and where she's going... she sends me Christmas cards of her and her baby grandkids – Rural, #15

This surgeon was impressed by her patient's optimism and enjoyed interacting with her on a personal level, not just as her surgeon. She went on to talk about a second patient this way:

[A]nd the 30-year-old with breast cancer and 5 kids at home who hugs me and says, "Just keep praying, doctor." I'll pray 'cause there's not a whole lot else I can do, but I'll pray. I sent her out because we don't have plastic surgery, and she's this beautiful 30-year-old, and I really wanted her to have immediate reconstruction, and they did a nice job. They did the tummy flaps to reconstruct, and for her, it was particularly nice 'cause she had worked really, really hard and lost like 100 pounds by diet and exercise, and it's how she found the lump. When she lost all the weight, the lump became obvious. So for her, getting a free tummy tuck with her breast reconstruction was great, and she's also just, like, the most lovely, positive person, too... And when she cries, I cry with her. – Rural, #15

This surgeon did not hide the fact that feeling a friendship with a patient is emotionally challenging, and she felt no shame in showing that emotion.

Some surgeons talked about valuing long-term patient relationships for their own sake, and some discussed them in the context of challenging emotions and shared values. Still others discussed that the overlap of professional and personal roles yields patient experiences that are

validating. For example, one surgeon had been going through some health problems and was feeling sad about his condition. He recounted:

[O]ne of my worst lows, I, I'm walking through the hospital, end of the day, and I'm feeling miserable, and I see a pastor and his wife, young couple, and they're followed by like four girls... Four little girls... she's pregnant with a fifth. She's getting her ultrasound.... and literally, even though they're around town, I really hadn't, I hadn't had an in-detail conversation with them except for about seven years earlier, when I did the D&C for the miscarriage she was having... So. Anyway, [seeing her children] made me smile... you know? – Rural, Pilot #1

The surgeon felt that because he had been able to help her through her miscarriage many years ago, the patient had been able to go on and have several healthy children. Family was an important value to this surgeon, so when he saw this healthy family having resulted from his care, he felt happiness and pride. While the overlap of his personal and professional roles was emotionally difficult, it was also rewarding.

To close this section on specific patient cases, I am including a story about another person who was saved, and because she lived, another life was brought into the world. This rural surgeon said:

[T]his has been 20-some years ago... I was on trauma call, and there was a young girl that got smashed in a car. [...] She had... a ruptured diaphragm, and she had a ruptured aorta, in her chest, was torn, her aorta. And a pelvic fracture. And I called the helicopter like 10 times 'cause she was gonna die if she didn't get outta here. And there was nobody, nobody transporting. It was winter, there was a blizzard... [W]e had to take her to the operating room... so we cut her open and fixed her spleen and her diaphragm, and then we kinda kept going right up into the chest because we couldn't get her liver down where it was supposed to be. So, we cut her this way, all the way up into her chest, closed that, turned her over and opened her left chest and sewed her, her aorta together with a graft, piece of plastic tubing that we'd normally use in the belly... we were forced to do it... She was in the ICU, sick as hell... but 7 days later she walks out. Um, she had a young boy who was probably 3 years old or somethin' like that. And so, he would've lost his mother if we hadn't done that... [A] year after... [she] went and got pregnant. She has a pelvic fracture, all this stuff we did to her—she got pregnant. And, delivers a, a baby girl. And so, this is, 20-some years ago... I'd never met that child. And last Christmas... I met this beautiful young lady that was the, the, the [baby] girl that [patient] had... But I met this beautiful young lady that would not

have been around... [S]he wouldn't be on this earth if we hadn't taken a chance... So. That kinda sums up why we're here. – Rural, #13

He was emotional as he told this story, wiping tears away. He not only felt satisfaction from the success of the surgical outcome, but also from the fact that his patient went on and had a healthy child whom he was able to meet 20 years later. It was clear he experienced an overlapping of his professional and personal roles and found fulfillment in that.

Personal identity: for comparison, the urban surgeon perspective.

Urban surgeons reported having many core values such as honesty, giving back to their community, and leading by example, similarly to rural surgeons as well. They also experienced the same kind of continuity of values from early in life to their present-day lives.

All urban surgeons in this sample tended to have identified their early interests in medicine or surgery on their own. A few urban surgeons, though, said they were dubbed “smart” as a child and that adults told them they were “supposed to” go into STEM professions or be doctors. For example, one urban-urban stayer said, “[A]s long as I can remember, the smartest kids were told, ‘You’re gonna be doctors.’ And so, I was the smartest kid, so they told me I was gonna be a doctor” (Urban, #27). Another urban-urban stayer reported similar pressure from adults, but he also recognized that medicine was in his “nature”:

I always did very well in school... young kids who did well in school... there was always this... ‘Oh, you’re gonna be a doctor- you’re good at science’ or ‘You’re good at math’ type of thing. But I don’t know how much that influenced it versus, it [medicine] seemed to be part of my nature from a very early age. – Urban, #29

Like this surgeon, many urban surgeons expressed early interests in medicine, science, and math, and like rural surgeons, these interests did turn into rewarding surgical careers.

In terms of personality traits, urban surgeons ran just as wide a gamut as did rural surgeons. Some described themselves as caretakers, others said they disliked anything illogical.

There were those who loved academics, and others who had hated school. Some described themselves as obliging, with one saying, “I’m not the kind of person that usually says no” (Urban, #23). Others were more oriented toward going all-out, as one urban surgeon said, “most surgeons” do things “to the nth degree” (Urban, #24). Just as was true with rural surgeons, no single personality type or set of personality characteristics stood out as typical of all urban surgeons. Overall, there were no significant difference between rural and urban surgeons in terms of the kinds of values instilled in them early on that are still relevant.

Surgical identity: for comparison, the urban surgeon perspective

Urban surgeons reported many of the same traits that rural surgeons did as being part of a surgeon archetype, but some used adjectives rural surgeons had not, like analytical and logical. Urban surgeons tended to emphasize achieving more than rural surgeons. One urban surgeon went so far as to say, “[M]ost surgeons are masochists” (Urban, #23). Other used less extreme terminology, such as, “I over-achieved” and “[E]ven before I was a surgeon, I was driven” (Urban, #24).

Identity alignment: for comparison, the urban surgeon perspective

Urban surgeons experienced a great degree of alignment between their personal and professional identities, as rural surgeons did. The ways they discussed these being instilled in them, though, were slightly different. As one might expect, only one urban surgeon had an agricultural background, so there were far fewer mentions among urban surgeons of values associated with an agriculture-centric life and very few analogies between farming and surgery. In stark contrast to rural surgeons, urban surgeons rarely discussed work-life balance, free time, or vacations. Whereas for rural surgeons, these issues were tied to the overlap of their professional and personal identities, for urban surgeons, this tie apparently did not exist.

The urban surgeons, like the rural, were confident in the alignment of their personal values and attitudes with what they perceived to be the professional values and attitudes of surgery. This alignment helped them keep setbacks in perspective and remain focused on completing training and becoming the kinds of surgeons they wanted to be. Very few instances of being told they were misaligned were reported. One urban surgeon reported that she had been told throughout her career, “I’m too nice to be a surgeon, ‘You’re not the surgeon personality’ ... I always find that really weird, and that’s sort of made me sensitive” (Urban, #5). This has affected how she reacts when her professional and personal world collide outside of work.

By in large, however, urban surgeons said they were attracted to surgery as a profession for the same reasons rural surgeons were. They identified themselves as action-oriented and pragmatic, they wanted to fix things and see instant results, and they liked hands-on learning and working with their hands. Overall, there was very little difference between the type of identity alignment experienced by urban surgeons in comparison to rural surgeons.

Role overlap: for comparison, the urban surgeon perspective

The key difference between urban and rural surgeons was in the lack of overlap between the personal and professional roles. Within the professional role there were differences as well. In contrast to rural surgeons, urban surgeons reported that they approached their professional role by setting goals specifically for the composition and development of their careers. Generally, those goals tended to be set by the completion of their residency. As discussed in Chapter 6 regarding scope of practice, in urban areas general surgeons often have the option to sub-specialize to a degree, and there are typically more opportunities to take on administrative, teaching, and research responsibilities. Many of the urban surgeons in this sample knew during training that they wanted this kind of variation in their professional lives. Rural surgeons were

far more likely to have more general career goals. They, too, wanted successful clinical practices, but at the outset of their careers they usually did not have detailed plans to take on formal administrative, teaching, or research responsibilities. Many of them did, in fact, end up engaging in these pursuits. Some adopted leadership roles in professional associations, and others becoming volunteer medical school faculty, but these opportunities arose over time and were not usually part of rural surgeons' practice location decisions. Urban surgeons prioritized locations that would allow them to achieve the composition of clinical, administrative, teaching, and research responsibilities they wanted.

Consistent with this, several urban surgeons said finding the right surgical practice was more important than finding the right community. One identified himself as “career-focused” and “adaptable” (Urban, #17), elaborating by saying:

I tend to make my decisions based on professional and career trajectory... I could work or live in, in any community. I've lived in a lot of different ones, and they're all good for different reasons, so... I don't have strong feelings about that. I feel like I could be happy- you plop me down almost, in almost any community, and I'll find reasons to like it. It's the way I am. – Urban, #17

For him, his professional role not tied to a place or any personal roles he might take on in a place.

Urban surgeons were far less likely to describe an overlapping of their professional and personal roles, although they definitely experienced an alignment of their personal and professional identities. To illustrate the separate existence of roles, one urban surgeon described having various communities, some professional and some personal, and did not describe them as overlapping:

I'm kind of [city] community, but really like the [hospital], and then I'm like part travel soccer team for my son, like that's my community. Like I, I'm part [school] where my kids go to school, so... my communities are like these bubbles around where my kids are and where I am. – Urban, #17

This surgeon acted in his professional and personal roles in different places across his city.

Another urban surgeon said she had witnessed how physicians' personal and professional roles could overlap during medical school on a rural rotation and during her residency, which was also in a rural location. She referred to her rural rotation as "crazy" and when asked what she meant, she answered:

[T]he surgeon was the only one there [during medical school rotation]. Like, he was essentially always on call... it seemed to me, like, they were just very dedicated people to both their profession and their community. To serve it in that way, because, you know, we work hard to – and I learned this in residency, which I know we'll get to – but it's hard to be a doctor in a small town and to see your patients at the grocery store and know that something went wrong with something that you did, right? Or people who have complications, or people who have family members die. Like, and then you see them at the grocery store, or you see them at church, and... that's hard... that takes a special kind of person to, to do that all the time, and for their whole careers. So I just, that to me was the crazy part about it- is that there were people that chose to practice in that sort of environment. – Urban, #31

While this surgeon had admired her rural colleagues and even considered going into rural practice herself, she clearly saw the overlapping of professional and personal roles as emotionally challenging and knew she would have to face that herself if she were to become a rural surgeon.

Urban surgeons like #31 usually understood that for rural surgeons, professional and personal boundaries were more permeable, and dual relationships often occurred. Most urban surgeons delineated the boundaries between their professional and personal roles fairly clearly, and most did not speak about non-clinical facets of patient relationships at all. One urban surgeon broke this mold, saying he gives out his cell phone number to patients and wants them to know, "I'm in this with them" (Urban #1).

Place integration: for comparison, the urban surgeon perspective

Identity and place. Some urban surgeons identified with their state rather than a particular town or type of town, as did a few rural surgeons. None of them explicitly said they were a “city person,” in contrast to rural surgeons who identified as not city people. One stated he had no preconceived notions about where he wanted to live except that New York City was too urban for him.

Experiences of place integration. Urban surgeons far less frequently mentioned running into their patients outside the clinical setting. When they did, they sometimes described these interactions as uncomfortable and awkward. One urban surgeon, who grew up in a smaller town, acknowledged that because of her upbringing, she probably ought to be more comfortable with this overlap of roles, yet she was not.

Urban surgeons had the same opportunity to report meaningful patient interactions that rural surgeons did, but most did not. None shared patient stories comparable to those shared by rural surgeons. This should not be taken to mean that urban surgeons do not value their patients or the surgeon-patient relationship. Instead, it suggests their focus is different. Perhaps when they are asked about surgery in interviews like these, it is easier to focus on the technical aspects of surgery and running a surgical practice as opposed to picking out individual cases. Alternatively, maybe they think those technical, tangible aspects are supposed to be the focus of such an interview. In general, the urban surgeons in this sample did not seem as in touch with the more intangible aspects of surgery, like relationships, as rural surgeons did. This lack of evidence of place integration suggests that urban surgeons may integrate into a place over time, but their experience doing so is not as intense as it is for rural surgeons. This likely has a great deal to do with the low density of acquaintanceship in urban areas. Because the “everybody knows

everybody” phenomenon is not occurring in most metropolitan areas, urban surgeons do not have the opportunity for it to interact with any role overlap they may be experiencing.

Discussion

Both urban and rural surgeons reported experiencing significant alignment between their personal and professional identities. Regardless of where surgeons practiced, they shared traits like decisiveness, an orientation toward logic, and a strong work ethic. They eschewed traits like egotism and disapproved of harsh or mean behaviors, particularly in the clinical setting. Part of the reason they felt fulfilled by surgery was that the work and its outcomes were consistent with what they found personally worthwhile as well. For example, the surgeon who reported needing to tally up what she had done in a day in order to feel like she had “earned [her] keep” (Rural, #21). I concluded from this data that these surgeons considered their personal identities inextricable from their identities as surgeons. There could not be one without the other. In this respect, rural and urban surgeons were more alike than different.

However, urban and rural surgeons did differ in that rural surgeons experienced an overlap of their personal and professional roles, whereas urban surgeons hardly ever did. Rural surgeons experienced this overlap on a regular basis, not only seeing patients inside and outside the clinical setting but also routinely interacting with them in their non-patient roles, such as grocer, banker, friend, or neighbor. Rural surgeons embraced these dual relationships, whereas urban surgeons sometimes found them uncomfortable when they occasionally happened. Some urban surgeons had experienced this discomfort on rare occasions when they encountered a patient outside the clinical setting, but others merely theorized that such instances would be uncomfortable, having not actually experienced them for themselves. Surgeons’ attitudes about the interaction of their roles and the relevance of that to their communities were formed over

time and varied greatly depending on their exposure to different kinds of communities. Rural-rural stayers in this sample were not “purely” rural, because all of them completed some portion of their education or training in an urban area. Similarly, not all urban-urban stayers were “purely” urban, because some of them completed rural rotations during their education or training or they previously practiced in rural areas.

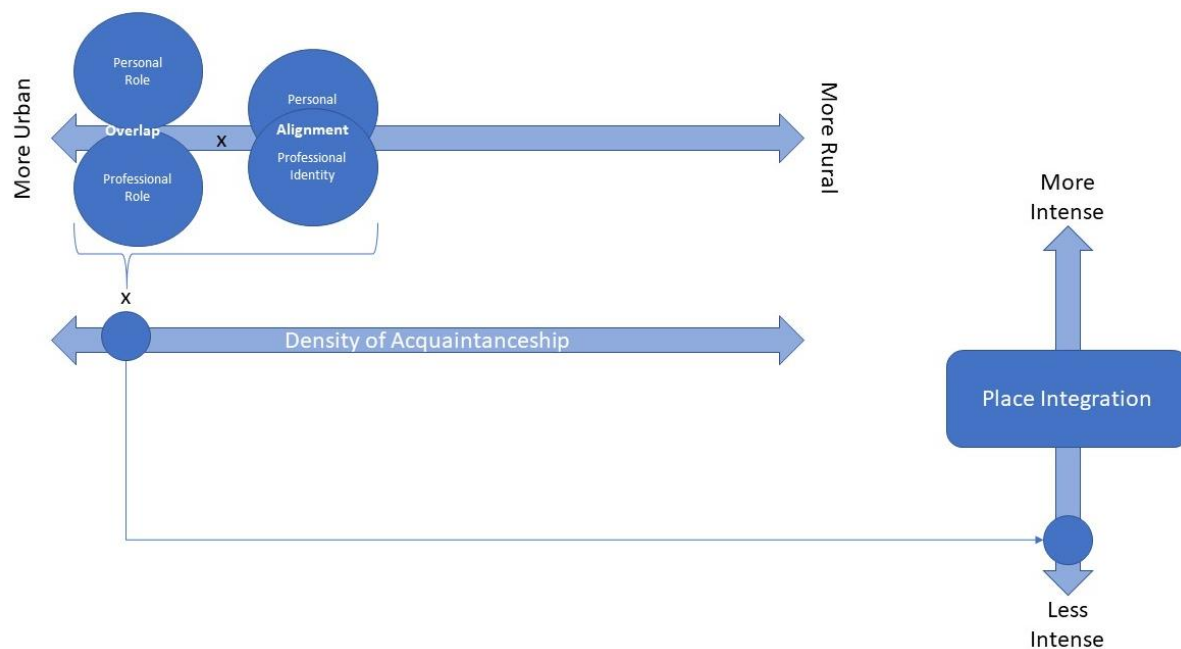
The concept of density of acquaintanceship is relevant to the rural-urban continuum and is a particularly useful construct for understanding why the overlap of surgeons’ personal and professional roles’ interaction with communities produces varying intensities of place integration. Density of acquaintanceship is defined as, “the proportion of [a community’s] residents who are acquainted with one another” (Freudenburg, 1986). This phenomenon has been evident throughout this qualitative data, notably where rural surgeons reported a high density of acquaintanceship where “everybody knows everybody.” Some reported that this tightly-knit social fabric resulted in people being willing to support, help, or look out for one another.

Evidence of place integration in this chapter, such as the emotional patient stories shared by rural surgeons, showed that when surgeons experienced an overlap of their personal and professional roles in the context of a community with a high density of acquaintanceship, the result was highly intense experiential place integration. The experience of integrating into their community was an emotional and even stressful process, but at the same time, rural surgeons found it highly rewarding. This is supported by research on social networks that has found that the web of people we know and how we know them “influences our success in life, our security and sense of well-being, and even our health” (Fischer, 1982). Other researchers have found that rural life does not give physicians the option to avoid dual relationships, and even if they had the option, it is unclear they would opt-out. According to work by Brooks and colleagues, “Many

rural physicians find deep satisfaction in being involved in their communities... they appreciate the opportunity to better understand their patients by observing and interacting with them in their broader life context” (K. Brooks, Eley, Pratt, & Zink, 2012).

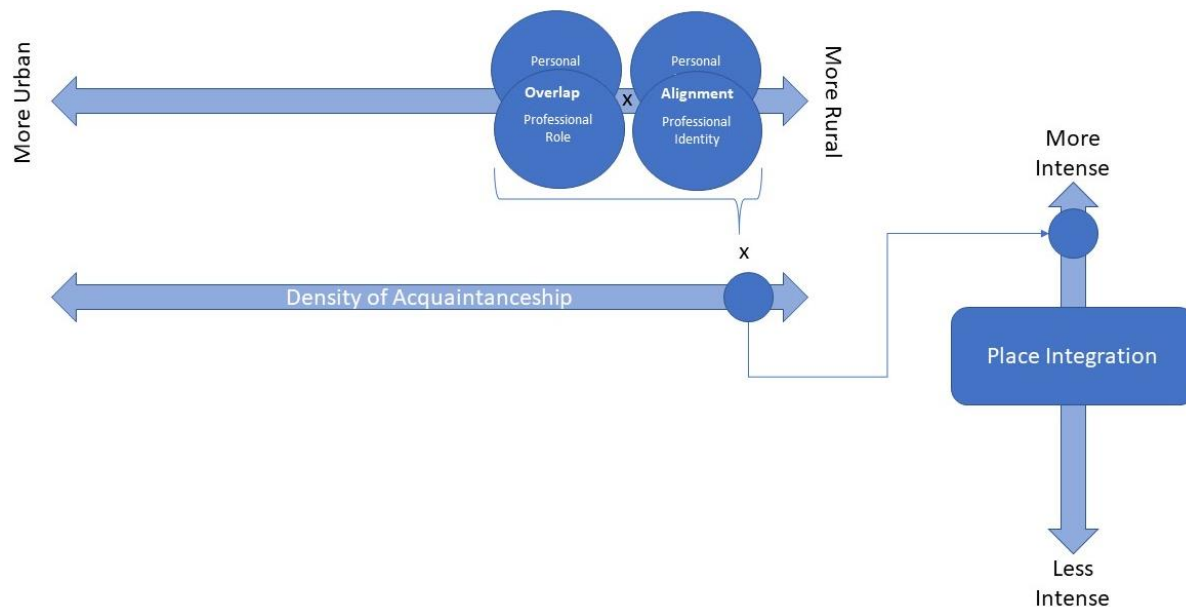
This dissertation has allowed for further development of theory related to how place integration occurs for urban and rural surgeons. Figure 14 is an example of how the factors discussed in this chapter might interact for an urban surgeon and produce low-intensity place integration.

Figure 14: Urban Surgeons and Low-intensity Place Integration



In comparison, Figure 15 is an example of how these factors might interact for a rural surgeon and produce high-intensity place integration.

Figure 15: Rural Surgeons and High-intensity Place Integration



The utility of these findings in rural surgeon recruitment and retention lies in focusing on the overlapping of roles, rather than the alignment of identities. Surgeons identify as surgeons no matter where they practice or may want to in the future. The key may be to make prospective rural surgeons aware of the social processes that result from their personal and professional roles overlapping in rural communities. Conversations about what to expect from rural surgery could include discussions about dual relationships, which surgeons in this sample reported could be challenging but also highly rewarding. Potential recruits may need to know that their surgeon-patient relationships will likely be long-term and may more closely resemble the types of doctor-patient relationships typically seen in primary care specialties. By sharing information about the pros and cons and density of acquaintanceship and its interaction with this overlapping of roles, surgical trainees could have a more complete picture of what rural surgical practice can be and what meaning and impact it can have on their lives, their family, and their patients. This holistic view is critical to developing more effective rural surgeon recruitment and retention strategies.

Part IV: The End of the Beginning

Chapter 8: Future Research Directions

Each component of this dissertation provides valuable directions for future research. Research Question 1a, focusing on the characteristics of individual surgeons, showed that the rurality of one's birth place and training locations may factor into one's future practice location. Therefore, further investigation into "movers" and "stayers" is warranted not only among general surgeons in the Midwest, but across all physicians or within other individual medical or surgical specialties nationwide. It would be beneficial to delve into the chronology of practice location decisions, identifying different points in time when surgeons are located in urban or rural locations. For this dissertation, I constructed this chronology for surgeons in the quantitative sample by assigning RUCC values to the birth cities, medical school location, residency location, and current practice location. However, the AMA MasterFile does not include all past practice locations; therefore, it is impossible to know if surgeons lived in other places between completion of residency and their current location. This movement, from initial practice location to current, deserves further investigation since it would indicate surgeons learn about one type of place and then, with that knowledge, elect to stay or move to someplace similar or different. For "movers," it is worth investigating whether the timings of moves are associated with other life events such as marriage, divorce, the birth of children, or the death of parents. This would help us separate the factors we can control, such as community and surgical infrastructure, from factors we cannot, like births and deaths. Unfortunately, the AMA MasterFile does not include variables related to parents, marriage, divorce, or children. Another more comprehensive data source would be needed, or an original survey could be created to capture this information. It could be possible to coordinate with certification boards, such as the American Board of Surgery

(ABS), to complete such a survey on a rolling basis as examinees complete the continuous certification process. If the ABS were willing to include a short survey about demographics and practice locations at the conclusion of certification exams, it could provide invaluable data relevant to the surgical workforce.

Research Question 1b provided insights into the value of certain rural community characteristics, namely health resources and economic development. Future research could involve using data on the economic well-being of rural hospitals to compare communities with a thriving healthcare sector with communities struggling to keep their hospital doors open. Specific health resources and amenities could be compared among these communities. Some states and localities offer economic incentives, such as tax abatements, and with data from these programs, we could investigate how many medical professionals are taking advantage of these programs and how long they remain in rural communities after incentives expire. One example is the Rural Opportunity Zone program in Kansas, the data from which is housed in the Kansas Department of Commerce. These data, paired with qualitative data from key informants in rural communities, could help us further separate the role of economic incentives from the role of non-economic factors, such as the social context of a place, in practice location decisions.

Findings related to health resources also point to another valuable area of research: the surgical team. As pointed out in Chapter 4, surgeons cannot operate alone and need not only nurses but also anesthesiologists or nurse anesthetists, surgical technologists, sterile processing technologists, and more. In Chapters 5 and 6, the qualitative data showed that rural surgeons find themselves struggling to find and keep high-quality staff, and those who do work with them often need on-the-job training. Additional investigation into the supply of various professions is

needed if we are to comprehensively address the issue of rural health disparities tied to access to surgical services.

An additional dimension to this work is potential geographic differences. For example, the unique topography of the Mountain West may present unique circumstances that drive the need for rural surgical services and affect the role of community characteristics and experiential place integration. Similarly, the eastern Midwest's rural communities are typically in closer proximity to larger communities, whereas in the western and particularly northwestern Midwest, rural communities are much farther away from each other and from urban centers. In these states, time and distance post a greater barrier to access to surgical care. In contrast, New England and the Southwest may present entirely different challenges. It is possible that a national strategy for rural physician recruitment and retention is impractical due to the nuances behind practice location choice. Instead, regional, state, or even local approaches may be more effective. All of the aforementioned directions can be given more depth by investigating using mixed methods or qualitative research. Both Research Question 2 and 3 provide excellent starting points for such pursuits. The qualitative findings suggest that while tangible community characteristics are important in practice location decisions, the meanings that surgeons attach to them are critical to understand if recruitment efforts are to be successful. If we were to investigate economic programs like the Rural Opportunity Zones, evaluating the success of those programs and their relevance to healthcare professionals would need to have a qualitative component in order to understand the meanings attached to this incentive. Perhaps the incentive is merely a catalyst for more meaningful social processes, potentially even place integration. The findings from Research Question 3 tell us that how a person becomes part of a community matter in that person's personal and professional satisfaction. People, including surgeons, who are just

starting out in their career, likely try to anticipate whether or not they will be successful and fulfilled. By seeking more qualitative data about success, fulfillment, and their relationship to place integration, we may be able to supply vital information to future healthcare professionals who are trying to make significant life decisions about their careers and locations. It is critical to continue to address the “why” and the “how” of healthcare workforce questions by learning directly from potential future practitioners, students, residents and other trainees, and those in practice.

Chapter 9: Conclusion

If current forecasts hold true, the rural surgeon shortage will worsen in the coming years. To address this problem and ensure rural areas have access to surgical services, we must improve our rural surgeon recruitment and retention strategies. This requires going beyond the quantitative data we have on surgeon supply and demand and considering who surgeons find meaning in their lives, not only as surgeons but as people. This dissertation's primary contribution has been to uncover the deeper meanings of the drivers of rural surgeon practice location decisions and add to our understanding of the interaction between identities and roles across the rural-urban continuum. With the conclusions from this work, we can approach prospective rural surgeons from the perspective of long-term professional and personal satisfaction. We can help them understand what a rural surgical practice is like, not only in scope of practice, but in terms of surgeon-patient relationships and integration into one's community.

The quantitative analyses, when limited to urban-born surgeons, showed those more likely to be urban-rural movers were slightly older and more likely to be male. DOs had a higher likelihood of being urban-rural movers compared to MDs, though the number of DOs in the sample was low. Urban-rural movers were more likely to have completed a less urban residency and completed residency outside the Midwest. Urban-born surgeons were more likely to be urban-rural movers if their primary responsibility in their current practice was patient care. Some of the same characteristics were identified in the expanded model, which was limited to rural-born surgeons and sought characteristics unique to rural-rural stayers. Rural-born surgeons who were rural-rural stayers were more likely than their rural-urban mover counterparts to have completed a less urban residency, to have attended residency outside the Midwest, and to have current responsibilities centered on patient care. Unlike urban-born surgeons, the rurality of a

rural-born surgeon's birth city was significant, whereas the demographics of age and sex were not. An effect was also found for attending a less urban medical school, in the opposite direction than expected: rural-born surgeons who attended a less urban medical school were less likely to become rural-rural stayers than they were to become rural-urban movers. Also, in contrast to urban-born surgeons, there was an effect for medical school region: rural-born surgeons were more likely to be rural-rural stayers if they had completed medical school within the Midwest.

Those engaged in medical education can consider these results in several ways. First, both the urban-born and rural-born surgeons who went on to practice rurally completed less-urban residencies located outside the Midwest and were likely to have responsibilities centered on patient care. Less-urban residencies were defined here as those in counties with an RUCC of 3 or greater. Few such residencies currently exist, and educators could consider establishing more less-urban and rural residencies, or at minimum rural rotations or rural surgical training tracks within traditional surgical residencies. The finding that many Midwestern rural surgeons were trained outside the region may not be significant in practical terms. It is possible that there are enough residencies around the edges of the region, in cities like Denver, Oklahoma City, Nashville, and Louisville, that movement from there into the Midwest was in reality not a significant move for surgeons even though they technically crossed regional lines. Nonetheless, surgical residency programs in the Midwest would be well-advised to consider whether they are doing everything they ought to be to train general surgeons who could provide much-needed services their states' rural areas.

There were certainly limitations in the surgeon-level quantitative analyses, due to the variable available in the AMA MasterFile. There were no variables for any demographic other than sex. There were no variables pertaining to family, such as marital status or children, and

there were no past practice locations included, all of which would be very pertinent for my research questions. The MasterFile is regarded as the most reliable and comprehensive dataset on physicians in the nation. It does rely on surgeon-reported data, though, and suffers from the same drawbacks other datasets do that rely on self-reported data.

In analyses of rural counties that had successfully attracted at least one urban-rural mover, a few key differences emerged between them and counties that had not had that success. Counties with an urban-rural mover had a higher likelihood of having a hospital, having slightly fewer hospital beds per 1,000 people, having slightly more primary care physicians per 1,000 people, having an intensive care unit, having more grocery stores, and having more arrests due to violent crimes. It is not surprising – and in fact is consistent with previous research – that the presence of health resources is important in recruiting surgeons. These results suggest these resources matter in particular for attracting surgeons who are not from rural areas. They also suggest that the breadth of resources matters, for example having an intensive care unit and not only a medical-surgical unit. Also, unsurprisingly, several variables representing amenities were highly correlated, suggesting that when businesses do well in an area, a positive momentum builds that helps additional businesses take root and thrive. These results prove that the basics – like grocery stores – do seem to matter, and if a community has good access to basic stores compared to other, nearby communities, prospective rural surgeons and their families are likely to notice. Rural communities looking to recruit general surgeons do not necessarily need to go to great lengths in economic development to attract these professionals. Instead, they should focus on making sure their community has basic grocery and retail, especially compared to any similarly-sized neighboring towns. They can set themselves apart by being just a notch above the next town over.

Similarly to the surgeon-level analyses, there was a significant amount of missing data in the community-level analyses as well. While the HRSA AHRF data is very comprehensive and highly reliable, the U.S. Census Bureau County Business Patterns database is not as complete. Census researchers work hard to collect as much of these data as possible, but some NAICS codes still have minimal information.

Educators and communities should remember, of course, that each student, trainee, and surgeon is different, and multi-variate linear regression results can only tell us so much about the complex decision-making processes of human beings. We as humans have been known to make irrational decisions, that is, we do not always operate in the market mindset of optimizing benefits and minimizing costs. As a result, we sometimes make decisions that may not be in our self-interest or may not appear to others to be in our self-interest. This is one of many reasons why it is important to dig deeper, beyond the quantitative data, and beyond purely economic solutions, into qualitative data about what community characteristics matter to surgeons – and why – as they are making location decisions.

When they discussed community characteristics, surgeons emphasized that rural and urban areas are on a continuum, rejecting the usual dichotomization of urban versus rural. Even within specific segments of the continuum, such as very isolated rural areas with small populations, communities can be different from one another. There was a wide range of community characteristics that surgeons considered in their practice location decisions. Rural surgeons tended to dislike crowding and traffic and sought locations with more “wide open” and green space. They valued good economic health in prospective communities and tended to evaluate it by outward appearance, perceiving greater community investment where storefronts were filled and infrastructure seemed newer. Rural surgeons were aware that health resources in

a community drove the scope of practice that would be possible in that town, and they considered what kind of surgical practice they wanted to have simultaneously as they evaluated a prospective community's health resources. Amenities like K-12 schools were important conceptually more than practically. Rural surgeons tended to value community support for education and children, but they perceived these attributes through observation of community events and attitudes rather than evaluating schools using objective data like classroom metrics or test scores. Rural surgeons cared less about amenities like restaurants, retail, and cultural events than did urban surgeons, and they did not perceive distance from these amenities to be a barrier to accessing them. As long as they could drive to such amenities within a reasonable amount of time, they thought their access was sufficient to meet their needs.

Communities can make real use of this data. First, it is consistent with the quantitative findings that not only do health resources matter, but the types of health resources matter for surgeons. Rural communities can be confident that money spent on surgical infrastructure like proper sterile facilities, well-trained operating room staff, and modern equipment is a good investment in the community's health. Communities can also consider the results pertaining to schools and amenities. They can examine both the objective data on their K-12 schools as well as the overall community perception of the schools and assess whether they think there is adequate support for children and education. If there is more they can do, not even necessarily increasing per pupil funding, but providing a supportive environment for children and educators, then such an investment could make the community more enticing to surgeons and their families. Lastly, communities do not need to be overly concerned about amenities like restaurants, retail, and cultural events. So long as they make prospective rural surgeons aware of where these amenities are in proximity to the community, that will likely be satisfactory. Someone who is overly

concerned about these amenities is not likely someone who could be swayed to rural practice in the first place.

In terms of meaning, health resources held great importance for rural surgeons because they shaped the very nature of surgery. In places with fewer resources, surgeons were able to maintain broad scopes of practice in terms of types of cases, but their depth was limited depending on the staff, supplies, and equipment available for complex cases. They reported enjoying having broad scopes of practice, though, and they drew deep meaning from serving their communities through important clinical decisions, even those that were emotionally difficult and stressful. Because of the nature of rural surgery, surgeons were often recognized by their communities as the “town surgeon” and sometimes achieved “quasi-celebrity” status in the context of places with tightly-knit social fabrics. The more pervasive the “everybody knows everybody” phenomenon was, the more well-known the surgeon tended to be, but also, the more meaningful and longer-term the surgeon-patient relationships tended to be as well.

Spouses have been identified in previous research as important in physicians’ practice location decisions. These results confirm that, yes, spouses are important, but in most cases the surgeon and his or her spouse ought to be considered as a unit. Mutual decision-making was prevalent among the surgeons in this sample who were married, and most often, the couple was in agreement – and had been for a while – about the types of places they would live and what kind of lifestyle they thought different places would allow them. This suggests that if a community is recruiting a married surgeon, they can expect the search will be successful if the surgeon and spouse are in agreement about being able to envision a good life in the community, but it will fail if one or both cannot see that possible future.

Urban and rural surgeons shared similar senses of identity, most having merged their

personal and professional identities over time. The same values they identified early on in life carried through their education and training and were often reasons they named as to why they became surgeons. By finding a profession with an identity they perceived as aligning with their personal identity, the two – professional and personal – became inextricable. Urban and rural surgeons differed, though, in how they perceived and experienced their roles in their communities. Urban surgeons tended to separate their professional and professional roles, some even clearly identifying different areas of their life that exist quite separately, such as clinical work, research, home life, their children's school, and their faith community. They seemed to prefer to separate these roles, and by virtue of their locations' large population sizes, they were also able to do so. Rural surgeons far more frequently experienced their professional and personal roles as overlapping, if not entirely at least in part. They often interacted with their patients not just as patients but as their friends and neighbors. These dual relationships were reported to be deeply meaningful for rural surgeons, and many offered patient stories that were evidence of highly intense place integration having occurred over time. The same type of evidence was not present for urban surgeons.

Rural surgeon recruitment and retention can and should evolve to include the social context of rural life. Exposure to rural life during medical education and surgical training is beneficial, but it is only one piece of the solution to the rural surgeon shortage. During the recruitment process, attention must be paid to surgeons' goals and expectations related to scope of practice as well as lifestyle, and communities need to be aware that surgeons, if married, are usually engaged in a mutual decision-making process with their spouse. Prospective rural surgeons should be made aware that the overlapping of personal and professional roles that occurs in rural areas will affect them in tangible and intangible ways. An example of tangible

effects is that they will be recognized around town and may achieve a quasi-celebrity status. While this may sound appealing, it could make some surgeons uncomfortable, and they should consider that prior to arriving in a rural location rather than be unpleasantly surprised by it after moving. An example of an intangible effect is that they may face clinical decisions that are more emotionally difficult because of their dual relationships with their patients. Though many rural surgeons have found this emotional intensity worthwhile because of the significant meaning that positive outcomes then have, they have also admitted that this makes adverse clinical outcomes even more difficult. Whether a prospective surgeon considers these effects and judges them to be more positive or more negative is entirely subjective; to some, it will be appealing, but to others, it will be a deterrent. We are not likely to find a clear way for recruiting communities to know which surgeon will make which judgment, but surgeons ought to be made aware that rural practice may require emotional fortitude and resiliency. Urban and rural surgeons do not differ by personality, and none of them entirely fit what either would call the ‘surgeon archetype.’ It is not possible to look at the curriculum vitae and other quantitative data for surgical residents and know, without a shadow of a doubt, which will find rural surgical practice most rewarding. It is only by talking with them, exploring their preferences within surgery, discussing their values and attitudes toward patient care, and discussing the potential overlapping of personal and professional roles that we can understand their intentions and what types of communities may be a good fit. If we are to play matchmaker between surgeons and communities, we must talk to surgeons and strive to understand them on a deeper level than numbers, personality frameworks, and academic and clinical achievements.

Appendix A: Additional Regression Results

Chapter 3

Table 26: Preliminary Analysis, Version 2: Exclusion of "Primary Responsibility is Patient Care" Variable

Source	SS	df	MS	Number of obs		3,215
				F(8, 3206)		26.58
Model	30.548	8	3.818	Prob > F		0
Residual	460.603	3,206	0.144	R-squared		0.062
				Adj R-squared		0.060
Total	491.151	3,214	0.153	Root MSE		0.379
Outcome: Surgeon practices in a rural county	Coef.	Std. Err.	t	P>t	[95% CI]	
Rurality of birth county	0.038	0.004	10.070	0.000***	0.031	0.046
Age	0.003	0.001	4.300	0.000***	0.001	0.004
Sex	-0.058	0.017	-3.390	0.001**	-0.091	-0.024
MD (0) / DO (1)	0.162	0.039	4.190	0.000***	0.086	0.238
Less urban medical school (1 = yes)	-0.006	0.022	-0.280	0.779	-0.050	0.037
Less urban residency (yes = 1)	0.129	0.023	5.540	0.000***	0.083	0.174
Medical school in the Midwest (yes = 1)	0.014	0.017	0.870	0.383	-0.018	0.047
Residency in the Midwest (yes = 1)	-0.055	0.016	-3.400	0.001**	-0.087	-0.023
Constant	-0.011	0.037	-0.280	0.777	-0.084	0.063

***Indicates statistical significance at the $p < 0.01$ level.*

****Indicates statistical significance at the $p < 0.001$ level.*

Chapter 4

Table 27: Robustness Check 1, Version 1: RUCC 4-7 Only; All Variables in Final Model

Source	SS	df	MS	Number of obs	463	
				F(10, 452)	23.050	
Model	38.839	10.000	3.884	Prob > F	0.000	
Residual	76.171	452.000	0.169	R-squared	0.338	
				Adj R-squared	0.323	
Total	115.011	462.000	0.249	Root MSE	0.411	
County has an urban-rural mover	Coef.	Std. Err.	t	P>t	[95% CI]	
Population (scaled)	0.064	0.017	3.680	0.000***	0.030	0.098
Percent Medicare	0.006	0.006	1.030	0.303	-0.005	0.017
Percent Poverty	0.000	0.005	0.000	1.000	-0.010	0.010
Percent College	0.004	0.004	0.980	0.327	-0.004	0.012
Presence of Hospital	0.189	0.076	2.470	0.014*	0.038	0.339
Hospital Beds	0.000	0.000	0.270	0.790	0.000	0.001
Primary Care Physicians	0.007	0.002	2.690	0.007**	0.002	0.011
Presence of ICU	0.141	0.045	3.130	0.002	0.052	0.230
Grocery Stores	0.063	0.047	1.320	0.187	-0.031	0.156
Violent Crimes	-0.013	0.044	-0.290	0.773	-0.098	0.073
Constant	-0.316	0.194	-1.630	0.103	-0.697	0.064

*Indicates statistical significance at the $p < 0.05$ level.

**Indicates statistical significance at the $p < 0.01$ level.

***Indicates statistical significance at the $p < 0.001$ level.

Chapter 4

Table 28: Robustness Check 2, Version 1: RUCC 4-7 with Hospitals Only; All Variables in Final Model (Exclusive of Presence of Hospital Variable)

Source	SS	df	MS	Number of obs		427
				F(9, 417)		20.230
Model	32.440	9.000	3.604	Prob > F		0.000
Residual	74.296	417.000	0.178	R-squared		0.304
				Adj R-squared		0.289
Total	106.735	426.000	0.251	Root MSE		0.422
County has an urban-rural mover	Coef.	Std. Err.	t	P>t	[95% CI]	
Population (scaled)	0.066	0.018	3.610	0.000***	0.030	0.101
Percent Medicare	0.007	0.006	1.100	0.271	-0.006	0.020
Percent Poverty	0.000	0.006	-0.030	0.975	-0.011	0.011
Percent College	0.004	0.004	0.890	0.376	-0.005	0.013
Hospital Beds	0.000	0.000	0.310	0.754	0.000	0.001
Primary Care Physicians	0.006	0.003	2.410	0.017*	0.001	0.011
Presence of ICU	0.141	0.046	3.030	0.003**	0.049	0.232
Grocery Stores	0.076	0.051	1.480	0.140	-0.025	0.177
Violent Crimes	-0.006	0.047	-0.130	0.900	-0.098	0.086
Constant	-0.158	0.201	-0.790	0.432	-0.554	0.237

*Indicates statistical significance at the $p < 0.05$ level.

**Indicates statistical significance at the $p < 0.01$ level.

***Indicates statistical significance at the $p < 0.001$ level.

Chapter 4

Table 29: Additional Analysis: RUCC 8-9 with Hospitals Only; All Variables in Final Model (Exclusive of Presence of Hospital Variable)

Source	SS	df	MS	Number of obs	160
				F(9, 150)	4.830
Model	1.909	9.000	0.212	Prob > F	0.000
Residual	6.585	150.000	0.044	R-squared	0.225
				Adj R-squared	0.178
Total	8.494	159.000	0.053	Root MSE	0.210
County has an urban-rural mover	Coef.	Std. Err.	t	P>t	[95% CI]
Population (scaled)	0.109	0.054	2.020	0.045*	0.002 0.215
Percent Medicare	0.002	0.004	0.420	0.675	-0.006 0.009
Percent Poverty	0.004	0.004	1.020	0.311	-0.004 0.012
Percent College	0.012	0.005	2.420	0.017*	0.002 0.021
Hospital Beds	0.000	0.001	-0.770	0.441	-0.002 0.001
Primary Care Physicians	0.023	0.008	2.900	0.004**	0.007 0.039
Presence of ICU	0.059	0.057	1.020	0.310	-0.055 0.172
Grocery Stores	-0.013	0.050	-0.250	0.801	-0.112 0.087
Violent Crimes	-0.078	0.055	-1.420	0.157	-0.186 0.030
Constant	-0.374	0.163	-2.290	0.023	-0.696 -0.051

*Indicates statistical significance at the $p < 0.05$ level.

**Indicates statistical significance at the $p < 0.01$ level.

Appendix B: Qualitative Interview Guide

Introductory Script:

Thank you for agreeing to be interviewed as part of the “Role of Community in Midwestern General Surgeons’ Practice Location Decisions” research study. You have received a copy of the consent document, and I want to make sure you understand participation is voluntary, and you can elect to cease participation at any time.

The primary goal of this study is to hear directly from urban and rural surgeons in the Midwest about how they became surgeons, how they chose their practice locations, and what their experiences in surgical practice have been like. We are hoping to shed more light on what role communities themselves play in surgeons’ decisions about practice location and what ‘community’ means to surgeons. We think it will help inform future rural surgeon recruitment and retention in particular and may even help alleviate the rural surgeon shortage long-term. With that, I’d like to start by asking you about your background.

Interview Guide

1. PERSONAL BACKGROUND

Tell me about where you grew up.

☐ Note race/ethnicity, ask

What was it like there?

☐ Hometown

Can you tell me a little about your family,
the people who raised you?

☐ Parent professions

☐ Mentors

☐ Influencers

Tell me about your decision to go to college.

☐ Year entered college

2. TRAINING AND RECRUITMENT

What was the process of getting into
medical school like? (then residency, other
training)?

☐ Mentors

☐ Influencers

☐ Medical school name

☐ Residency program name

Take me back to when you finished training
and were deciding on where you would go
into practice.

☐ First year of practice

What was being recruited like? What places
were you considering?

☐ Others involved in decision

(If in a relationship) Was your partner
involved?

3. CURRENT LOCATION

Tell me about when you first came here.
What was the beginning like?

What is a day in your life like in [insert town name], at home, in clinic, at the hospital, just start to finish?

[When they mention the Operating Room]
What's the team like – nurses, techs, etc.

[When/if they mention referring physicians]
Tell me more about the medical community here, particularly your fellow physicians.

Tell me about your time off – what you do, where you spend it.

Can you tell me a little about your family?

What do they (family members) think about [insert town name]?

Are they involved around town? What is the social scene like?

[If have children]
Are you children still in town?
And so they went to school here...?

Could you tell me about what makes rural surgical practice unique, in your opinion?

How about rural life, more generally?

Would you recommend rural practice to a newly-trained surgeon?

4. FUTURE

Has there been a time when you thought seriously about changing practice locations?

Tell me about your plans for the next few years.

Do you think, or have you thought, about retirement, as in when, or where?

- ☐ First practice location and year
- ☐ Other locations?
- ☐ Current location, number of years there
- ☐ Number of years in practice, total
- ☐ Call schedule
- ☐ Nurse support, staffing, quality
- ☐ Anesthesia support, staffing, quality
- ☐ “Bench strength”
- ☐ Age of other physicians
- ☐ Quality of other physicians
- ☐ How much time off
- ☐ Marital status
- ☐ Children
- ☐ Family receives care in town?
- ☐ Community integration
- ☐ Education
- ☐ Any comparisons to urban physicians
- ☐ Moving?
- ☐ Any comparisons to urban
- ☐ Retirement timeline
- ☐ Any mention of recruiting replacement?

Appendix C: Snowball Structure

Sources were personal or professional contacts in surgery. Some sources were not interviewed because they did not meet the selection criteria; however, they gave me referrals to surgeons who did fit the selection criteria. Some interviewees did not provide referrals.

Source 1 (not interviewed)

- Pilot 1
 - Pilot 5
 - Int 1
 - Int 2
- Pilot 3
- Int 3
- Int 4
 - Int 32
- Int 5
- Int 6
- Int 10
 - Int 7
 - Int 8
 - Int 9
- Int 18
- Int 21
 - Int 19
 - Int 20
 - Int 22
- Int 23
- Int 24
- Source 7 (not interviewed)
 - Int 25
 - Int 28
 - Int 29
- Source 9 (not interviewed)
 - Int 30

Source 2 = Pilot 2

Source 3 = Pilot 3

Source 4 = #13

- Int 11
- Int 14
- Int 15
- Int 16

Source 5 (not interviewed)

- Int 12

Source 6 = Int 17

Source 8 = Int 26

- Int 27

Source 10 (not interviewed)

- Int 31

Appendix D: Qualitative Codebook

Classification Codes:

- Cool Stories
- Great Quotes
- Gender
 - Female
 - Male
- Movers and Stayers
 - Rural-rural stayers
 - Rural-urban movers
 - Urban-rural movers
 - Urban-urban stayers
- Opinions about recruitment and retention
- Urban/rural
 - Currently rural-RUCC
 - Currently rural-self
 - Currently urban-RUCC
 - Currently urban-self
 - Grew up rural-RUCC
 - Grew up rural-self
 - Grew up urban-RUCC
 - Grew up urban-self

Substantive Codes:

- Amenities
 - Brands
- Climate and topography
- Economics
 - Practice models
- Family
 - All other
 - Children
 - Parents
 - Partners
 - Partner in Decisions
- Free time
- Home (current house and property)
- Identity
 - Moments of self-doubt
- Moments of clarity
- Moments of indecision
- Patient interactions
- Practice of surgery
 - Nurses and non-physician providers
 - Other (non-human) resources
 - Physician relationships
- Processes
 - 1- Choosing medicine in general
 - 2- Choosing surgery
 - 3- Acculturating into surgery
 - 4- Recruitment experiences
- Pursuite of career advancement
- Regionality
 - Midwesternness
 - Other regions
- Size big- the nature of a more urban place
- Size comparisons
- Size small- the nature of a more rural place
- Social fabric
- What the future looks like

Appendix E: Qualitative Analysis Tables

Table 30: Thematic Network Analysis, Chapter 5: Range of Community Characteristics

Global Themes (All)	Organizing Themes (Examples)	Basic themes (Examples)
Use of space	The debate about “what is rural” is ongoing	Rural versus frontier, what is rural has wide range of populations, high school graduating class size as proxy for town size
	Smaller places feel less busy and less crowded	Smaller means not busy, slower pace, not crowded, having space is appealing, likes the isolation, space is freedom
	In urban areas, can co-locate different circles of life or not	Some form community around home, co-location is convenient, profession and amenities are co-located, co-location means easy access to amenities
	In smaller environment, people are often out in nature, working and playing	Out in nature, kids playing outside, feels at home around nature now, sounds of nature, animals and wildlife are common
Commerce and the local economy	Economic conditions vary within rural and within urban	There can be growth, perception that suburbs were once rural, economic decline, small town needs healthcare as economic driver
	Agriculture still important in smaller communities	Agriculture plays key role, agriculture is key, agriculture is important
	Communities doing well are more appealing	Poverty, run-down appearance is telling, community investment is important
Health resources and scope of practice	Building, scaling, and volume	Volume can be variable, quantity plays role in quality, what is “enough” work to merit hiring another surgeon, likes being busy, one practice is built then you scale up
	Call	100% call means can’t commit to anything else, constantly on-alert wears on you, can do heavy load for a while not forever
	Partners as mentors	Learning on the job, fewer or no partners means more responsibility, good partner dynamics have fueled good scope and good outcomes, encouraged by partners to build and broaden, has taught younger surgeons and they’ve taught older
	Scope of practice, types of cases	A lot of scopes, don’t see many rare cases in rural, “doctor, you are plastics and ortho,” if

		surgeon is not prepared rural breadth can be scary, wide variety of cases, have to be able to do cases in other specialties (i.e. gynecology)
Amenities	Among rural surgeons, heavy emphasis on crime, violence, and trauma in bigger cities	Crime, crime in some areas, crime and trauma, violent in the inner city, violence and personal danger, trauma and violence, there's more trauma
	Restaurants	Lots of restaurant choices, restaurants, lots of high-quality restaurants, economic development reflected by types of restaurants, smaller has fewer restaurants
	Retail	Have to plan out your shopping when live in rural, retail more convenient in larger
	Public transportation	Ease of access to amenities facilitated by public transportation, public transport good for work, rail means access, ease of transportation is important, traffic is bad so avoid driving
	Cultural events	Cultural amenities important, easy access to cultural events in urban areas

Table 31: Descriptions and Illustrative Quotes for Each Global Theme, Chapter 5

Global Themes	Description	Illustrative Quote (Rural and Urban)
Use of space	The ways surgeons describe their physical settings, such as crowded or not, having heavy traffic or not, how much wildlife there is, and including 'wide open' or green spaces.	<p><i>It's all in the eye of the beholder. I, of course, don't feel rural here, because I was raised where you would go out at night, and you could see the stars, and there was no streetlights, and you didn't hear any sounds... I mean [spouse] probably feels more rural than I do because she was raised in a little [town name]-type town... - Rural, #7</i></p> <p><i>The suburbs that I tend to like are the ones that have a downtown, you know, have ease of access to things, um, that you can walk to or ride, you know, my kids can ride their bike... I just like that idea. I don't like the idea of being trapped in my car all the time. - Urban, #25</i></p>
Commerce and the local economy	The ways that local businesses and the health of the local economy factor into surgeons' considerations	<p><i>[W]hen I first came here... very big mining population, the biggest employer was the coal mines. And, uh, then they closed. And then, farming has evolved, and many generations have no one to leave their farms to. So the biggest employer right now is healthcare. And education. So, they go hand in hand. They're symbiotic here. - Rural, #16</i></p>

	about a practice location.	<i>I think the thought process was, if [city] didn't work out, then it would be best that we were in a big city so that if [spouse] had to change jobs, you know, either [company] would have an office there, or there was [sic] other opportunities for her. So, we were really looking at pretty big cities for that reason, for her job. – Urban, #25</i>
Health resources and scope of practice	The range of health resources available to a surgeon and the effect that range has on surgeons' scopes of practice, as well as why that effect occurs.	<p><i>Anything I thought was gonna be challenging I tried to do it a day when [part-time partner] was there just in case, so he could run across the street and help me if need be. But you know, a lot of stuff comes in in the middle of the night, and you have to just take [it], and it was challenging. – Rural, Pilot #5</i></p> <p><i>[Past mentor] was also a general surgeon. He did all sorts of procedures. That type of practice is not realistic in today's environment... particularly in an academic center, so you have to be more focused. – Urban, #28</i></p>
Amenities	The range of amenities that matter to surgeons as they consider practice location decisions.	<p><i>I don't think it was a magic number as far as the population or the number of stoplights or the size of the schools or anything... I'd heard about the [annual festival], a community that supports its children, and you see that in the parks and the schools, both Catholic and public schools. So, I think that stood out. – Rural, Pilot #4</i></p> <p><i>I walk two blocks from my house, I get on the light rail, and I'm here, [...] versus, you know, my parking garage, which is twice again as far [...]. So, those things, surprisingly matter, whereas, yeah, I know people who have, you know, hour-long commutes and stuff. Couldn't do it. Couldn't do it. [...] It's like a 7-minute train ride from my house. It's awesome. - #5, Urban</i></p>

Table 32: Thematic Network Analysis, Chapter 6: Meaning Associated with Characteristics

Global Themes (All)	Organizing Themes (Examples)	Basic themes (Examples)
Finding meaning in one's environment	People (rural): Tightly woven social fabric	Everybody knows everybody, you are known/your people are known, not just about individuals but also families, no anonymity, people know the surgeon, relationships last and matter
	People: (urban) Social circles	Notion of "big small towns," some big places don't feel as big as they "should," friends found via work and school, friends come from

		different circles, different social circles didn't necessarily overlap
	Place (rural):	No nature in big lots of concrete, nature and gardening in rural, likes parks and nature- gets that more in rural
The nature of surgery	Building a practice (rural)	Volume can be very variable; believes he needs to be busier; what is 'enough' work, likes being busy, high volume is source of pride
	Call (urban)	1 in 4 call is 'not bad,' has 12 partner- 1 in 6 call, has lots of partners, home call is preferable to in-hospital, there is pay for call, takes in-house trauma call
The role of spouses	Mutual decision-making (rural)	Having conversations about location choice; partner has been integral part since medical school; mutual, logical decision-making, based on surgeon's career primarily; mutual based on both careers
	Partner's career (urban)	Place driven by spouse's career; two major factors, spouse's career and surgeon's training; aligning both surgeon and spouse professional opportunities; does not want to leave current but would if spouse's job dictated

Table 33: Descriptions and Illustrative Quotes for Each Global Theme, Chapter 6

Theme	Description	Illustrative Quotes (Rural and Urban)
Finding meaning in one's environment	The ways that the people, or social fabric, of a community, as well as the physical characteristics of a place give meaning to surgeons' experiences there.	<i>[T]hey [community members] know when you die, and they care when you're sick in a small town... I think that's highly unique, and... we're all kind of in it together. [...] I see that with folks who've become ill... you can come back home and, and people take care of 'em... because of a pre-existing relationship. – Rural, Pilot #1</i> <i>So, we had family in both of those places [Boston and Chicago], and so we would go back to visit, and I just, I really, I didn't like the traffic, I didn't like the way that everybody was in a hurry. Nobody cared a bit about anybody else, everybody was just into themselves [...] it was just very unpleasant to be there. – Urban, #1</i>
The nature of surgery	How health resources and scope of practice form surgeons' roles in their communities and	<i>I come from a level I trauma center, and we would call blood bank alerts... they were running coolers every, like, 7 minutes or 5 minutes up to the trauma bay or the OR until we told them to stop... Um, and what a security blanket. And now we don't. Um, that scares me. That's one</i>

	what meaning they associate with these roles.	<p><i>thing, and probably the biggest adjustment for me is figuring out when to ship [a patient] and when not to.</i> – Rural, #15</p> <p><i>I got, not, not pushed into, but just as it happened, and I let it happen because I decided it was okay to do more and more breast surgery... I'd be okay with the better lifestyle of a breast surgeon, as opposed to a trauma and general surgeon.</i> – Urban, #31</p>
The role of spouses	How spouses factor into surgeons' considerations regarding practice location decisions and what this means to them and their families.	<p><i>She was a elementary teacher, and was fortunately able to find jobs in each location that we moved to. So that worked out pretty well. [Wife] pretty much agreed with everything I was looking at... we both wanted to stay in the upper Midwest, and uh, not such large cities, 'cause we'd been exposed to [urban center] ... So yeah, lots of smaller communities, upper Midwest, we both were on board with that.</i> – Rural, #19</p> <p><i>[M]y wife and I sat down, and I was interested in moving into a higher leadership job, so we sat down, and she said, "Nope, not there, not there," and I'm like, "okay." So I was like... "Why don't you draw me in the map where we're allowed to- where I'm allowed to look at jobs."</i> – Urban, #17</p>

Table 34: Thematic Network Analysis, Chapter 7: Identities, Roles, and Place Integration

Global Themes (All)	Organizing Themes (Examples)	Basic themes (Rural Only)
Personal identity	Original self	Role of original identity (includes agriculture); keeping original identity; didn't lose original/hometown identity; ag background never stopped being part of identity; early intentions
	Personal identity (current)	Who I am (non-surgical traits); knowing themselves; independence and drive; race, smart/good at school; faith; dislikes
	Confidence	Self-doubt or feeling lesser; recognizing faults, was certain post-training; doesn't care what others think
Surgical identity	Surgical personality	No patience for stupidity; independent and free-thinking; "not corporate guys"; can adapt; have to be adaptable

	Commitment and devotion (in patient care)	Chooses to commit; devotion to profession; “we” don’t abandon our patients; being a professional means being dedicated
	Values in patient care	Importance of continuity of care; top priority is the right care; values proper care and case management
Identity alignment	Why I chose surgery	Why I chose surgery, Why I am surgeon, Values in patient care, Commitment and devotion (in patient care), Pride (in profession), What surgery is
	Charity and selflessness	Oriented toward working for a good cause; values selflessness; values giving back
	Vacation and free time	No hobbies/none appealing enough to make time; relaxation has to be earned; feels guilty when away
Role overlap	Overlap of personal and professional	Professional and personal are the same; roles are on in the same; personal/professional are same, it’s not a job
	Responsibility	Feels great responsibility to patients, but also great reward in good outcomes; takes patient outcomes personally; readily accepts blame and responsibility
	Pride in profession	Pride in having unique skillset for the community; pride in status/being fellowship-trained; pride in longevity and reputation developed over time
Evidence of place integration	Place	Fit (community), outdoors/nature; insiders and outsiders; comfortable
	Reflecting back	Could they find another rewarding profession, ways they surprised themselves, a sense of fate, gratitude; patient stories

Table 35: Descriptions and Illustrative Quotes for Each Global Theme, Chapter 7

Theme	Description	Illustrative Quote (Rural)
Identity alignment	How surgeons think about themselves as people, their purpose in life, and what is fulfilling for them professionally and personally.	<i>I’ve been very happy, I’ve been very satisfied... We’ve done some things in this community that I’d be very proud of... and... I may not have been able to get those done in another community or a bigger community... I’ve been very happy and very fulfilled, I guess you’d say. I could quit right now with no regrets at all. – Rural, #13</i>
Role overlap	How surgeons discuss being a	<i>I kinda knew I wanted to be a surgeon, because... as a farm kid... you can say okay, we finished painting the hog house,</i>

	<p>surgeon and being a person, how they discuss the overlapping of personal and professional roles in their lives, and what this overlapping means to them.</p>	<p><i>we got the cows milked, we got the barn cleaned... very objective. Surgery fills that for me. At the end of the day, I took this gallbladder out, fixed this hernia, put this chest tube, so I can tally in my mind exactly what I did, okay? [...] I'm a doer, so, that part of it very much fit my personality, and I could account for... I had earned my keep of that day. – Rural, #21</i></p>
<p>Evidence of place integration</p>	<p>Instances in which surgeons discuss having become integrated into their communities over time and what meaning they draw from these experiences.</p>	<p><i>[W]hen he came to the emergency room... I said, oh, you're, it's, just snowing out, you're too sick to go anywhere else, I really think you have a mid-gut volvulus by the story. And his mother is very dubious, and said, no one at the children's hospital's ever mentioned such a word... I said, he needs to go to surgery now, it's gonna lose its blood supply. And twisted bowel. He's 23 years later, he's working in a wonderful job, and he's grown up... they send me a Christmas card, and I saw the progression of his aged. His mother works here as a secretary now, and she comments all the time about, he wouldn't be here if you hadn't taken care of him. – Rural #16</i></p>

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